Forty-Four Packages Make Honor Roll

By Don Leavitt
CW Staff

DELRAN, N.J. — Forty-four packages have been placed on the 1979 Software Honor Roll by Datapro Research Corp. as a result of ratings received in response to a questionnaire mailed to some 37,000 DP executives in using companies.

Only 30 packages were on the 1978 Honor Roll, a Datapro spokesman noted.

Although Datapro has altered some of its internal procedures for reporting survey results, the Honor Roll still lists the packages which received the best ratings and were mentioned and rated by 10 or more users. The packages were named by the users, not suggested by Datapro.

While more than a dozen packages are new to the Honor Roll this year, five have been on the list seven times. These include Alltax from Management Science America, Inc., the Disk Utility System from Westinghouse Electric Corp., Epat from SDI, The Librarian from Applied Data Research, Inc. (ADR) and Panvalet from Pansophic Systems, Inc.

Four packages made the list for the sixth time, including Easytrieve from Pansophic, Fast/Dump/Restore (FDR) from Innovation Data Processing, Inc., Quikjob from Systems Software Support, Inc. and Syncsort from Whitlow Computer Systems, Inc.

Responses From 5,683

Datapro received responses from 5,683 users who provided ratings on 2,142 packages. The complete results are summarized in a $15 report, "User Ratings of Proprietary Software," reprinted from the December supplement to the research organization's major reference book, *Datapro 70.*

The report provides survey results for the

(Continued on Page 8)

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
Weekly Newspaper Second-class postage paid at Framingham, Mass., and additional mailing offices
© 1980 by CW Communications, Inc.
Vol. XIV, No. 2 January 14, 1980 $1.00 a copy; $30/year

Systems Rival IBM 30

PALO ALTO, Calif. — National Advanced Systems has jumped head first into the high end of the IBM-compatible computer market with three systems to compete with the IBM 30 series.

The Advanced Systems (AS)/7000 family will be manufactured by Hitachi Ltd. and will include three models: the 7000N, the 7000 and the 7000DPC. Deliveries of all units will begin in the second quarter.

The first system has 2M bytes, expandable to 8M bytes, six to eight channels and 1.8 to 2.2 times the throughput of the IBM 3031, the firm claimed. The basic configuration is priced at $1.1 million.

The AS/7000 has approximately 1.2 times the throughput of the IBM 3032, National Advanced Systems said, adding that it can handle up to 16M bytes of main memory and 16 channels. The 7000N can be field-upgraded to this model, which is priced at $1.5 million.

The 7000DPC is a dual-processor complex with throughput reportedly equal to the IBM 3033 when operating under MVS or VM 370. The unit is priced at $2.3 million for the basic configuration, which includes 4M bytes and 12 channels.

For all of the units, the price for 1M byte of memory was set at $50,000. Options include a four-channel I/O processor for $175,000 and a second console for $20,000.

National Advanced Systems was formed when National Semiconductor Corp. took over the computer operations of Itel Corp.

National Advanced Systems said it would offer leases for the systems. See next week's *Computerworld* for full details.

IBM Does About-Face, Hikes Prices Up to 20%

By Marcia Blumenthal
CW Staff

ARMONK, N.Y. — After a busy year tempting users with trade-in offers and frequent price reductions, IBM did a year-end about-face, increasing prices across the board for most of its equipment, maintenance and program products.

Explaining simply that the increases were necessary because of the higher cost of doing business, IBM hiked its prices 5% to 20%. The stiffest increases hit labor-intensive offerings — maintenance and program products — which rose 10% to 15%.

With few exceptions, IBM raised equipment purchase prices generally by 5% and lease and rental rates by 7%.

Most purchases and hourly maintenance increases became effective upon announcement Dec. 28. The rest of the hikes go into effect April 1.

Despite IBM claims that it is a victim of inflation, some industry analysts saw the increase, particularly for the 4300 series, as the company's way of equalizing prices it initially set too low. Chronic underpricing most likely contributed to the 18% drop in earnings IBM experienced in its third quarter compared with 1978 results, they suggested, and the price increases are a means of plumping margins.

Some Products Untouched

IBM spokesmen from both the Data Processing Division (DPD) and the General Systems Division (GSD) said the company reviewed the entire product lines of the divisions and based increases on costs.

However, some products at both GSD and DPD totally escaped increases in purchase, rental or lease rates. At GSD, the System/38, the 5520 administrative system and the 5110 processor, along with three Series/1 models — the 4952, the 4964 and the 4974 — were unchanged. At DPD, only the newly introduced 3279 color graphics terminal, the 3101 Teletype-compatible gear and models

(Continued on Page 6)

Users Split on Sticking With IBM 38

By Tom Henkel
CW Staff

A random survey of 20 DP managers who ordered the IBM System/38 revealed that half have decided to take delivery of an alternate system.

Some DPers said they just couldn't wait any longer. Others, who could wait, didn't want to be a troubled system's guinea pigs.

IBM recently announced a revised System/38 delivery schedule. Shipments will now be 11 months later than originally promised — which is about two months longer than the six- to nine-month delay IBM announced last August.

IBM watchers say problems with the batch segment of the System/38 operating system caused the delays. IBM claims to have resolved all problems.

Although the problems with the System/38 may have shaken some DPers' confidence in the machine, they apparently haven't lost confidence in IBM. Seven of the 10 DP managers who are taking alternate systems have chosen another IBM machine. The System/34 and the 4331 rank highest on their lists.

With the first System/38 now scheduled to be delivered almost a year later than originally offered, few DPers said they are happy with their new delivery dates. Nevertheless, six of the 10 DPers still interested in the System/38 said the extra wait won't cause any real hardships. Four, however, said the extra wait will hurt.

"IBM had so many problems getting [the System/38] to do what it thought it was going to do, we're not really sure

(Continued on Page 6)

U.S. Counterattacks in I/O Standards Suit

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — Four computer manufacturers seeking to block a federal I/O interface standard brought their case to federal court with "unclean hands," the Commerce Department charged in documents recently filed in district court here.

The government said the "generally obstructionist tactics" of Honeywell, Inc., Control Data Corp., Burroughs Corp. and Sperry Corp. during the lengthy standards development process bar them from receiving through the courts any relief from the controversial I/O standard and three related standards, which go into effect June 23.

The four companies filed separate but similar suits last fall asking that implementation of the standards be blocked. They argued that former Commerce Secretary Juanita Kreps exceeded her authority in adopting the standards. Those standards, they argued, will harm their federal trade to the benefit of IBM, on whose architecture the standards are based [CW, Oct. 22].

Federal Judge John G. Penn heard government arguments Jan. 3 for dismissal of the case. A ruling on the government's motion was expected by the end of last week. If the motion is

(Continued on Page 8)

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
TM reg. U.S. Pat. Off

Editor E. Drake Lundell Jr.

Managing Editor Nancy French

Senior Editors:
Software Donald Leavitt
Industry Marcia Blumenthal
Communications Brad Schultz
Features John C. Whitmarsh

Senior Writer:
Communications Phil Hirsch

Correspondents:
West Coast Jeffry Beeler
Washington, D.C. Jake Kirchner

Writer/Analyst Marcy Rosenberg
Staff Writers Tom Henkel
Timothy J. Scannell
Connie Winkler
Jay Woodruff
Marguerite Zientara

Chief Copy Editor Cheryl M. Gelb
Copy Editors Nancy Fleming
Catherine Marenghi
Steve Milmore
Barbara T. VanScoyoc

Photography Editor Ann Dooley

Editorial Assistants Denise Petski
Martha Taylor

Editorial Cartoonist Jim Orton

Contributors:
Education J. Daniel Couger
Taylor Reports Alan Taylor
Human Connection Jack Stone

For Sales, Circulation and Production contacts, see inside back page.

Please address all correspondence to the appropriate department at 375 Cochituate Road, Framingham, Mass. 01701. Phone: (617) 879-0700. Telex: 95-1153

OTHER EDITORIAL OFFICES:

West Coast: 407 California Avenue, Suite 10, Palo Alto, California 94306. Phone: (415) 328-8064.

Washington, D.C.: 821 National Press Building, 529 14th Street N.W., Washington, D.C. 20045. Phone: (202) 347-6718.

England: Steve Burton, IDG Publishing Ltd., 140-146 Camden Street, London NW1 9PF Phone: 01-267 1201. Telex: 851 264737.

W. Germany: Eckhard Utpadel, CW Publikationens, Friedrichstrasse 31, 8000 Munich 40, Phone: (089) 34-90-61. Telex: 5215350.

Asia: Hidetsuna Sasaki, Dempa/Computerworld Company, Dempa Building, 1-11-15, Higashi Gotanda 1-chome, Shinagawa-ku, Tokyo 141. Phone: (03) 445-6101. Telex: J2424461.

Australia: John P. Costello, Computerworld Pty. Ltd., 3 Bruce Street, Crows Nest, NSW 2065. Phone: 929-5388, Telex: SECCO AA25468.

Brazil: Eric Hippeau, Data News, Computerworld do Brazil, Servicos e Publicacoes Ltda., Rua Alcindo Guanabara, 25/10th floor 20031 Rio de Janeiro, RJ Brazil. Phone: (021) 242-7395 or 263-8046. Telex: 2130838(WORD BR).

Second-class postage paid at Framingham, Mass., and additional mailing offices PN127420. Published weekly (except: a single combined issue for the last week in December and the first week in January) by CW Communications/Inc. Copyright 1980 by CW Communications/Inc. All rights reserved. ISSN 127-420. Reproduction of material appearing in *Computerworld* is forbidden without written permission. Send all requests to Marion Kibbee.

'$1.00 a copy: U.S.— $30 a year; Canada, Central & So. America — $50 a year; Europe and Near East — $90 a year; other foreign — $150 a year (airmail service). Four weeks notice is required for change of address. Please allow six weeks for new subscription service to begin.

Computerworld can be purchased on 35 mm microform through University Microfilm Int., Periodical Entry Dept., 300 Zeeb Rd., Ann Arbor, Mich. 48106. Phone: (313) 761-4700. *Computerworld* is indexed: write to Circulation Dept. for subscription information.

RED TAG ABP MCC MEDIA DATA FORM

POSTMASTER: Send Form 3579 (Change of Address) to Computerworld Circulation Dept., 375 Cochituate Road, Framingham, MA 01701.

After FAA 'Foot-Dragging'

Nasa to Lead Air Collision Research

By Marguerite Zientara
CW Staff

WASHINGTON, D.C. — After years of apparent footdragging by the Federal Aviation Administration (FAA), a microcomputer-based airborne collision-avoidance system (CAS) research project will continue under the aegis of the National Aeronautics and Space Administration (Nasa) following a congressional mandate effective last November.

The action, taken by the House Appropriations Transportation Subcommittee, came after four years of congressional hearings on the subject of midair collisions and possible technologies to help avoid such collisions.

Filed in June, the action came in a year in which the media focused on a number of near midair collisions resulting from ground-based air traffic control (ATC) computer failures [CW, Nov. 12, Dec. 10]. It was also a year in which the FAA drew severe criticism for its alleged unresponsiveness to repeated requests for backup ATC computer systems [CW, Nov. 26, Dec. 3].

Besides giving pilots more "control of their own destiny," the CAS system to be tested by Nasa would also ease some of the burden of increased traffic that controllers must handle and would provide a pilot-oriented backup system for the present ATC system, according to George Litchford, inventor of the system and president of Litchford Electronics, Inc. of Northport, N.Y.

The congressional action directs Nasa to evaluate the feasibility of conducting a real-life situation test of the CAS system and, if it is found to be feasible, to report that to the committee and commence testing.

Use of Transponders

Since 1968, Litchford has been working on the concept of an airborne Beacon Collision-Avoidance System (BCAS) that makes use of altitude-reporting transponders currently installed in an estimated 200,000 U.S. aircraft and up to 75,000 Western European and Asian airplanes.

While these transponders currently transmit signals that are picked up by ground computers and fed to ATC display screens, Litchford explained, his BCAS system would also provide a pilot with his own CRT display of any nearby aircraft or obstruction — such as a mountain — that is marked with a standard beacon.

Therefore, in the event of a ground-based ATC computer failure, pilots would not have to rely solely on controllers who may be in the midst of a chaotic situation caused by transition from a computer-based, digitized ATC system to a "manual," broadband radar system.

Air traffic controllers have pointed out in recent years that, although controlling can be done accurately and efficiently without the computer-generated alphanumeric data indicating a plane's airline name, flight number, altitude and ground speed, it is during transition periods between the two types of system that controllers can become disoriented and momentarily lose control of their airplanes.

It is that type of environment that contributes to the potential for midair collisions, air traffic controllers and other industry observers claim.

"With BCAS, the pilot would not be attempting to control all the traffic," Litchford noted, "just his position in relation to all the other aircraft near him."

The BCAS system has evolved around a 16-bit, three-parallel-processor machine that acquires raw radar data, tracks and correlates targets and gives "threat determination" and display, according to John Hill, president of Megadata Corp. of Bohemia, N.Y., developer of the system's hardware.

Cycle times will be in the area of 1 microsec and memory size is expected to be about 24K words, he said. Current microcomputers under consideration for the final system include the Intel Corp. 8086, Motorola Corp. M6800 and the Zilog, Inc. Z80.

While Litchford's BCAS may seem like the perfect answer to some of

(Continued on Page 4)

Correction

Computerworld last week neglected to identify a contributor to the special year-end issue. Lawrence Seligman, author of "Computing in the '80s: Putting the Pieces Together," is vice-president of small business systems at Data General Corp. in Westboro, Mass. CW regrets the error.

This Week

IN DEPTH

Structured Walkthroughs .... Follows Page 64
EFT: The Law and You ID/21

NEWS

IBM Brings Out Terminal for Distributed Users 4
ASC Unveils Digital Communications Service 5
Analysts See No Change in IBM Rivals' Prices 6
Business Groups Deny Need for Privacy Laws 7
Further Cuts in International Telex Rates Likely 9
Ex-CSC, NCSS Employee Innocent of Fraud 10
Training Planned for Unix Users 11
Europe Moving to Protect Faltering DP Industry ... 12
Justice, IBM Making Little Headway in Talks 13
Systems House Building Turnkey for Dentists Hurt . 14
Michigan State University Gains CAD Facility 16
Hopper Warns of Staying Static 17
Expo '80 to Kick Off in San Mateo March 19 18
France Balks at Transborder Privacy Guidelines ... 20
Service Matches Employers, Job Applicants 21
'Fixed-Term Plan' Story Told in U.S. vs. IBM 22
On-Line System Helps Plot Quake History 24
DP School Takes Students With 'Ax to Grind' 25
User Goes From 360 to 4331 Hassle-Free 26
Talent Bank Locates Women to Serve Government 27
DP, Communications 'Like Scrambled Eggs' 28
MPU-Based 'Junk Dealer' Ties Buyers, Sellers 29
Transborder Data Policies Set as Topic 30
CPU Files Capture Work of 'Fairie Queene' Poet ... 31

EDITORIAL

Editorial: The Software Challenge 32
Human Connection: Management Maturity 33
Taylor Report: 'Correction' Creates Overcharge ... 34
Day-of-Week Algorithm Works to 20,000 A.D. 36
DP Professionals Write Quite Well 37
Computerized Gas Rationing Fair, Economical 40

SOFTWARE & SERVICES

Package Cuts Cost of File Copying 43
'Demand 90' Aids DEC Users in CRT Work 44
'RSS' Modules Support Retail Functions 48
Update Boosts 'Datamanager' Ties to DBMS 50
Users Still Harassed by Stubborn DP Attitudes 52
DBMS Gives City Better Approach to Programs ... 54

COMMUNICATIONS

'Pocket' Modem on its Way 55
Highest Salaries in Telecommunications 56
Survey Finds Big Gap Between Best, Worst Paid ... 61
IEEE Seeks Papers for Power Conference 62
Cassette Course Covers Communications Basics .. 63

SYSTEMS & PERIPHERALS

IBM Tests Experimental Circuit Elements 65
Crime Fighting Time: From Hours to Seconds 66
System Renews Reliability for Subscription Firm ... 68
System Clues Paramount as to Movies' Success ... 69
Florida Schools' System Sparks Pupil Interest 70
County, City, School Share Dual Processor 71

MINIWORLD

HP Unveils Personal Computer System 73
Tape System Fits PDP-11/70 74
Modcomp Units Use Low-, Mid-Range CPUs 75
Patient Tracking Aids General Practitioner 78

COMPUTER INDUSTRY

Silicon Valley Hit by Vendor Exodus 79
Ramtek Sets Goal: Tenfold Revenue Gain 79
Modcomp Sells 25% to West German Firm 80
DP Market Growth Steady in Southeast Asia 81
Computervision Expects No Problems 82
Six-Month Revenues Up by 27% at National Semi .. 83

DIVIDEND

There's only one DOS sort better than SyncSort 1.2.

(New SyncSort 1.3!)

Call (201) 568-9700.

DOS sorting just got better.

Years ago, when we were young and poor, we developed a very costly habit.

We decided that if we were going to compete successfully with the Colossus of Armonk in sort programs, life was not going to be a rose garden. Just developing a better sort on a *one-time* basis wasn't going to be good enough. We'd have to keep improving that product *ad infinitum*.

That's what we've done—again—with SyncSort DOS. Release 1.2 was the best DOS sort ever conceived. It grew to over 500 users in no time at all.

But 1.3 pushes the frontiers of DOS sorting out a little farther. It not only gives better performance in DOS/VS and DOS/VSE, it provides some new features that save an awful lot of programmer time and effort.

PERFORMANCE DIVIDENDS. 1.3 continues our old tradition of more sorting for fewer resources. If you compare the new release with any of IBM's DOS sorts, you'll see resource savings that look like this:

- **20-45% in Elapsed Time;**
- **10-50% in Overhead CPU Time;**
- **20-40% in Total CPU Time;**
- **20-50% in Disk Space Utilization;**
- **40-60% in SIOs.**

PROGRAMMER DIVIDENDS. 1.3 introduces a number of new features designed to reduce the effort that goes into applications programming:

- A new facility that prints sort output with page and column titles. When used with other features like INCLUDE/OMIT, SUM and OUTREC, this one can often eliminate a lot of time-consuming coding, compiling and debugging.
- COPY—copies one file onto another while bypassing the sorting process. A powerful file-edit utility when used with the three features above.

SYSTEMS DIVIDENDS. The new release is smart enough to sense your overall system requirements and then make adjustments to keep sorts from interfering with non-sorts.

- Storage Auto Option—a new concept that manages your system's real storage in accordance with your overall system priorities.
- PARM-EXIT—dynamically modifies sort parameters.
- Interfaces with many disk-space managers.

But the best way to find out what SyncSort can do is simply to try it. Benchmark it against your present sort on identical files and make your own judgement.

If we can help, give us a call. We're bound to be in the office. Working on the next SyncSort dividend!

OVERSEAS REPRESENTATIVES—

Düsseldorf: SyncSort Technology GmbH,
Tel.: 49-211-48-03-51
Johannesburg: Computing Benefits Ltd., 46-2083
Melbourne: Shell Co. of Australia Ltd., (03) 8400311
Milan: SYNTAX, (39-2) 87. 74. 44
Paris: CAP/SOGETI Produits, 33-1-539-22-25
Reading (UK): SyncSort Technology Ltd.,
44-0734-481919
Stockholm: BRA, 46 8 88 03 00
Tel Aviv: ADVANCED TECHNOLOGY Ltd., 442697
Tokyo: Software Engineering Co., Ltd., (03) 446 1811
Utrecht: SyncSort Technology BV, 030-31-26-11

WHITLOW
COMPUTER SYSTEMS Inc. 560 Sylvan Ave., Englewood Cliffs, N.J. 07632

Smart Programmable Unit Offers 64K

IBM Brings Out Terminal for Distributed Users

By Tim Scannell
CW Staff

ATLANTA — Introduced late last week by IBM's General Systems Division, the 5280 Distributed Data System features a programmable intelligent terminal with 64K bytes of main memory and the ability to communicate with any of the firm's other computer systems.

The firm also unveiled an impact matrix printer to go with the terminal system. The printer can achieve speeds up to 560 line/min.

Designed to "process and print business information at the point of origin," the 5280 can be used to enter, validate, store and process data without the support of an off-site CPU. Information can be transmitted to an off-site CPU, however, via telephone lines to update customer records or process orders to be kept in a remote file, a spokesman noted.

The 5280 can reportedly transmit and receive data from 370 series, 3031, 3032, 3033, 4331, 4341, System/3, System/32, System/34, Series/1, 3740 or 5260 computers. It can also access other 5280 systems.

A typical 5280 package consists of the programmable CRT/key station, two diskette drives that can store a total of 2.4M bytes, the recently introduced 120 char./sec 5256 serial printer and a communications adapter. However, the terminal system can be supplied with IBM's 5225 line printer, the impact matrix unit announced with the 5280.

The 5225 is available in four models and can print at speeds from 280- to 560 line/min at 10 char./in. In addition, it can condense information printed on 11 by 14-in. paper for 8.5- by 11-in. paper at speeds ranging from 195- to 420 line/min using 15 char./in.

The 5225 can also be used with the firm's System/34 as a system printer and/or a workstation printer.

The 5280 terminal system is available with IBM's recent DE/RPG programming facility and Cobol which compiles on a host computer under the control of OS/VS or DOS/VSE. Five units are available with the 5280 including desktop, single or dual programmable CRT/keyboard stations; desktop, single or dual nonprogrammable CRT/keyboard stations; and a floor-standing programmable control unit.

The typical 5280 configuration will lease for $517/mo on a two-year lease; it has a purchase price of $16,660. Depending upon the type and quantity of units selected, lease prices for other 5280 systems begin at $166/mo on the selected plan and can be purchased at prices beginning at $5,630. Shipments are scheduled to begin sometime in June.

Lease prices for the 5225 printer range from $315 to $440/mo on a two-year lease while purchase prices range from $11,650 to $16,350. Shipments on the printers are scheduled to begin in October.

The General Systems Division can be reached at P.O. Box C-1645, Atlanta, Ga. 30301.

CRT Terminal Consumes Little Power

DAYTON, Ohio — Low power consumption and shields against electromagnetic interference highlight an intelligent CRT terminal introduced by NCR Corp. last week for asynchronous communications as fast as 19.2K bit/sec.

NCR's 7900 Model I kicks off a projected family of intelligent terminals and supplants the vendor's 796-101 unit. Featuring a 12-in., green phosphor screen with displayed terminal status line, the microprocessor-based Model I consumes one-third the power of its predecessor, or roughly the amount of electricity consumed by a 40W light bulb, a spokesman claimed.

The teletypewriter-compatible device comes with built-in shields against electromagnetic interference, including radio frequency interference and electrostatic discharge, he added.

Special Keypads

Special function keys are included in the Model I's typewriter-style keyboard, along with an "adding machine-style" keypad that NCR said can be changed to a "telephone-style" pad at the customer's option. Up to 96 function-codes can reportedly be generated by the customer for special data handling procedures.

NCR credited the terminal's lower power consumption and cooler operation with eliminating the need for a cooling fan and thus allowing the unit to run more quietly than "many other general-use terminals."

The terminal operator can select transmission speeds and modes (character vs. line at a time). Alternatively, those selections can be made remotely by the host computer system.

With deliveries slated to begin later this winter, the 7900 Model I costs $2,000 and rents for $95/mo. NCR is in Dayton, Ohio 45479.

Nasa to Lead Air Collision Research

(Continued from Page 2)

aviation's most serious safety problems, considerable controversy surrounds the issue, as evidenced by the FAA's sudden cancellation of Litchford's contract in June 1978, after six years' work and $4 million in FAA funds spent.

The crux of the FAA's objection to an airborne CAS apparently lies in the fact that the agency has poured millions of dollars into a ground-based CAS called the Discrete Address Beacon System (Dabs), a system that would connect the ground ATC system and other data sources to aircraft via an automatic data link.

Dabs, unfortunately, would not be implementable for another 15 years, while BCAS could be operational as early as three years from now, Litchford claimed. And while the FAA claims BCAS would not be compatible with Dabs, Litchford claims BCAS would be compatible with but not dependent on it.

Litchford also claims that Dabs would entail installing new and expensive equipment in all aircraft involved, would interfere with the present ATC system and would require years to get International Civil Aviation Organization (ICAO) authorization.

In contrast with those claims, Litchford emphasized BCAS' utilization of already installed altitude-reporting transponders, its independence from the present ground-based ATC system and ICAO authorization that the claimed would be almost immediate.

Cancellation Triggered

It was Litchford's formal response to a Federal Register request for comments on Dabs that spring that apparently triggered the cancellation of the FAA contract, he recalled.

"The various reasons for terminating this promising effort given to me . . . include . . . the fact that we needed additional money to finish the work (less than 10% of the $4 million already invested); a new FAA policy was adopted to make all BCAS dependent fully on Dabs; although we had no technical flaws, we were not Dabs-dependent; and other reasons which seemed to change each time FAA was challenged to explain the unwarranted termination," Litchford testified in December 1978.

Litchford also cited a "secret report" issued by the FAA that purported to uncover flaws in the BCAS system. According to Litchford, the system tested by the committee was not the Litchford system at all, but a completely different and inferior system. Furthermore, Litchford was not given the report until "well after the fact," he testified, and therefore had no opportunity to refute the findings.

While not admitting that the system tested was other than Litchford's, FAA Chief Langhorne Bond did acknowledge in testimony, "We made a mistake by not giving him the report."

The computer and CRT equipment necessary for each airplane in the system would cost $20,000 to $25,000, with simplified versions for smaller planes costing as little as $1,500, Litchford said.

The New Alternative In Training

Scholar/Teach 3

Computer-Based Instruction
Software and Services
for IBM Systems

For more information call your nearest BCS office or contact:

EDUCATION AND TRAINING DIVISION
P.O. BOX 24346 • SEATTLE, WA 98124 • (206) 575-7450

BCS BOEING COMPUTER SERVICES COMPANY
A Division of The Boeing Company

EDUCATION AND TRAINING DIVISION
Boeing Computer Services Co.
P.O. Box 24346, Seattle, Wa 98124
MS 9A-90

☐ Please send me the brochure Scholar/Teach3
☐ Have your representative call for an appointment

name
title
organization
address
city state zip
telephone

ASC Unveils Digital Communications Service

By Phil Hirsch

CW Washington Bureau

GERMANTOWN, Md. — An all-digital data communications service, reportedly 10% to 15% cheaper than Bell's Dataphone Digital Service (DDS), was unveiled here this week by American Satellite Corp. (ASC).

Called Synchronous Data Exchange (SDX) Metroline, the service will be tariffed "within 60 days" and offered initially in eight cities — New York, Washington, D.C., Chicago, Houston, Tulsa, Okla., Dallas, Los Angeles and San Francisco, ASC Vice-President Harold H. Johnson said.

SDX Metroline will provide separate 56K bit/sec transmission channels to different customers through a common rooftop earth station installed at one customer's premises. The other customers, located up to 15 miles away, will be linked to this "host station" through coaxial cable or digital microwave channels. The latter will terminate in individual dish antennae having a diameter of "less than six feet," Johnson explained.

Lower Rates

Essentially, the new service is a multiplexed version of the 56K bit/sec SDX service, which ASC introduced some time ago. The big advantage of Metroline, Johnson explained, is substantially lower rates; they make satellite transmission competitive with terrestrial transmission between locations as close as 500 to 1,000 miles apart.

SDX, by comparison, is cost-competitive with terrestrial channels only for customers who have to transmit coast-to-coast. The distance may be less, however, if the customer requires more than a single 56K bit/sec channel.

Although rates for Metroline service have not been finalized yet, Johnson indicated that the monthly charge for service between points approximately 1,500 miles apart would range from $5,000 to $5,400. The comparable DDS rate is $6,000.

Aside from being more economical, Metroline will also provide an all-digital transmission path, end-to-end. DDS, by comparison, requires use of analog local loops in most cases, he added.

Johnson also reported that:

- A lower-speed version of SDX Metroline service may be tariffed later. It would use all the commonly employed bit rates down to 2,400 bit/sec. The initial SDX Metroline offering requires each customer to lease a 56K bit/sec channel.

  ASC will subdivide this facility, but all the subchannels must have a common termination. The prospective offering would lease subchannels to different customers.

- The microwave links connecting remote Metroline users to the host antenna may operate in the 10gHz band — the one selected by Xerox Corp. for its Extended Telecommunications Network. But other frequencies, ranging from 2- to 18gHz, are being considered. In any event, ASC will use a point-to-point microwave transmission scheme rather than the "cellular" architecture planned by Xerox.

- Although SDX Metroline initially will be a point-to-point service, ASC is considering a switched version enabling users with multiple sites to send messages back and forth through a switch attached to the host earth station. The sites could be located within the same or in different metropolitan areas.

Marketing Targets

ASC is clearly hoping its initial SDX Metroline offering will produce the kind of customer base needed to support a switched service. Johnson said the initial marketing targets are large retail chains, banks, insurance companies and oil firms — all of whom typically need to transmit data and messages among multiple locations.

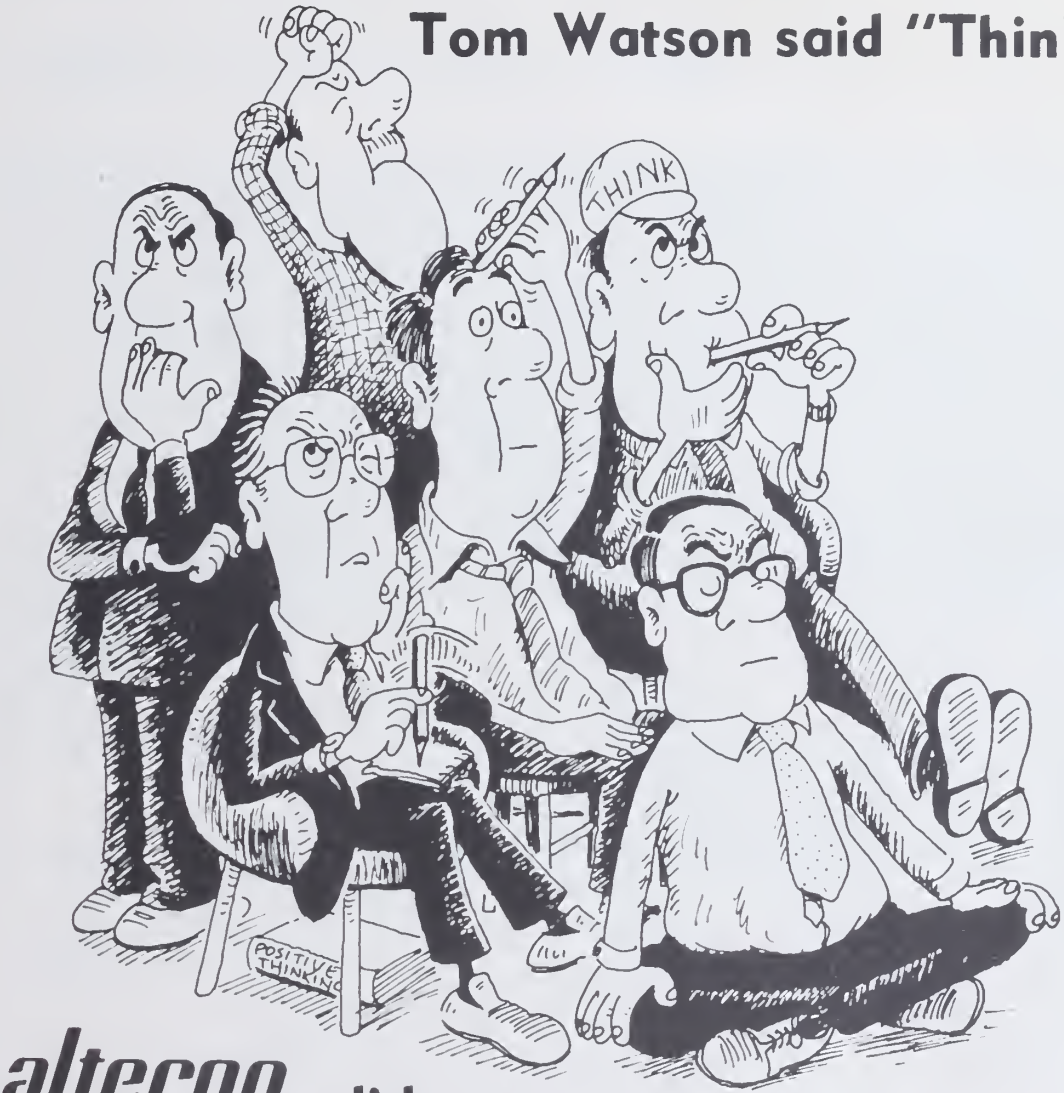
Johnson also said it is "possible" ASC will offer a packet-switched data communications service. While emphasizing that there are no immediate plans to do so, he reported ASC has recently proposed building "some" large packet-switched networks for private users.

By the end of 1982, he added, SDX Metroline service should be available in 40 cities. Two years later, a 100-city network is planned.

The upcoming SDX Metroline tariff, besides offering transmission at 56K bit/sec through a common host earth station, also will encompass optional multiplexing and communications control equipment.

The latter consists of an ASC-designed, microprocessor-based, digital controller through which users will be able to intermix digital video, digital voice, digital facsimile and computer data. The controller will allow the bandwidth to be reallocated dynamically among these applications.

Tom Watson said "Think."



altergo did.

Tom Watson was a cash register salesman. He founded a company that became the world's leading computer hardware supplier. Tom had a good motto. We've followed Tom's motto. We've thought about your data processing problems and we've created a line of computer software to solve the problems that accompany the hardware the Tom's company builds. For instance, SHADOW II, the world's most advanced T.P. Monitor might just help solve your data communications problems. If you would like to know how, fill in the information requested below and send it to us. We'll send you a free brochure which explains how. Think about it

☐ Yes, I've thought about it. Please send me a free Shadow II Brochure.

Also send me information on:

☐ **GUTS** Timesharing
☐ **CPG** On-line System Implementation
☐ **Quota II** On-line Programming
☐ **System/Manager** DOS/VS Resource Management

Name ______________ Title ______________
Company ______________
Address ______________
City ______________ State ______________ Zip ______________
Phone ______________
System ______________

altergo
ALTERGO SOFTWARE INC.
1000 Iris Drive
Conyers, Ga. 30035 (404) 922-7235

For Software Solutions — Think Altergo

Analysts See No Change in IBM Rivals' Prices

By Marcia Blumenthal
CW Staff

Although IBM's recent across-the-board price hikes for equipment, program products and maintenance was surprising, industry observers do not think the move will provoke widespread price changing by IBM's competitors.

Most analysts think IBM's price increases were made primarily to offset its deflated earnings, which during the third quarter declined 18% from 1978's third quarter.

"It shows that even IBM can't violate the laws of nature," Stephen Ippolito, president of IPL Systems, Inc., said in reference to the inflationary climate experienced by all businesses. Ippolito's firm makes the IBM plug-compatible Omega mainframe sold by Control Data Corp.

The IBM price hikes relieve pressure on other mainframers, Gideon Gartner of the Gartner Group, Inc. said. It gives them the latitude to hold prices at current levels and have more marketability or raise prices to improve their margins, he observed.

Overall, the impact on competitors will be nominal, Gartner said, predicting that IBM's year-end price hikes alone will add 25 cents per share to its earnings in 1980.

William Becklean, a vice-president at Bache Halsey Stuart Shields, Inc., said other mainframers earnings are not under the same kind of pressure as IBM's. "They haven't had the tremendous swing toward leasing as IBM did," Becklean observed.

Most mainframers contacted after IBM's announcement were hesitant to comment on future pricing plans. Most said they are evaluating IBM's announcement.

H. Glen Haney, Univac vice-president of worldwide marketing, said IBM doesn't necessarily lay down the ground rules. However, he did note that IBM's aggressive pricing has been confusing to the marketplace, creating an ambivalent attitude among users that has "destabilized" the market.

Pointing to Univac's long-time emphasis on leasing, Haney noted 70% of its business is on long-term leases. "Our five-year lease program is the backbone of our marketing effort," and Univac projects it will continue.

Haney did point out that pressure on maintenance costs is "most significant," and for that reason the company's maintenance contracts have escalator clauses.

As far as the plug-compatible makers (PCM) are concerned, Ippolito does not see price increases: "The PCMs are already selling machines that are higher priced [than IBM's] because of the long delivery times for the 4300."

He anticipates that future price cuts from IBM will not be as frequent as in the past.

IBM Borrows $30 Million From Saudis

ARMONK, N.Y. — In a continuing search for new funds, IBM recently borrowed $30 million from the Saudi Arabian government. The loan is in the form of a private placement of seven-year notes at 10.8% interest.

The proceeds of the borrowing will be used for increased capital requirements, the construction of manufacturing plants and for rental machines.

The new source of funds is considerably less expensive than borrowing on the firm's $1.5 billion credit line at prime rate. That credit line was negotiated with 37 banks last summer.

Despite its apparent need for cash, IBM has invested the Saudi funds in money market securities that pay about 3.25% more interest than IBM is paying on the notes, one analyst claimed. At that rate, IBM is making $1 million each month on the reinvestment, the analyst noted.

When it made a $1 billion public debt offering last October, IBM acknowledged it would probably need more more funds, analysts noted.

IBM Makes Price Hikes Ranging to 20%

(Continued from Page 1)

3843 and 3848 crytographic equipment were untouched.

On the other hand, both the 4300 and the 8100, including the newly introduced B models [CW, Dec. 17], were raised 5% on purchase and 7% on lease.

However, if users had placed an order for a 4300, signed the purchase contract prior to Dec. 28 and expect delivery before April 1, the original price still applies, an IBM spokesman said. Similarly, a lease contract for a 4300 under the same conditions will continue at the old rate for the first year.

Mainframe Prices

Under the latest price schedule, a 4331 with 1M byte of memory will lease for $1,895/mo on a two-year contract; the old rate was $1,775. The new purchase price for that system is $76,100; it formerly cost $72,500.

At the high end, a 4341 with 4M bytes of memory will lease for $7,190/mo, up from the present monthly lease rate of $6,725. On purchase, that system now sells $288,650, compared with the old $275,000 purchase price.

The purchase prices for most 370s were not changed except for 5% hikes for the 158 and 168. Also unchanged on purchase were 30 Series equipment. However, both 370s and 30 series systems were increased 7% on lease and rental.

At GSD, the purchase price for the System/3 was not raised, but the 7% increase in rental and lease applies.

To further confuse matters, some prices for the System/34, whose memory price was recently reduced by 33% and its CPU cost by 15% [CW, Dec. 10], were remassaged.

The November decreases were made possible because of the economies of Mosfet memory, the IBM spokesman explained. However, 24 of the 30 models in the System/34 series use both Mosfet memory and the 8-in. fixed Piccolo disks. Those models which use the Piccolo are subject to the price hikes, the spokesman said.

Aside from equipment, IBM raised maintenance fees 5% to 15%. At GSD, field installation rates increased 15% while hourly system engineering rates increased 10%.

Similar rates are in effect at DPD, but there is no particular pattern for the rate increases, a spokesman there said. Most 370s did not experience maintenance increases but some equipment not changed on purchase or lease did have a maintenance increase.

In addition, most licensed program products were raised 10% at both GSD and DPD. However, Installed User Programs and Field Developed Programs were unaffected by increases.

Moreover, the Office Products Division raised lease and rental prices 7% for its OS6 word processing system, but did not increase the purchase price. Maintenance for this system went up 20% from $150/mo to $180.

Users Split on System/38

(Continued from Page 1)

whether we're going to take one. We probably would have been able to have one of the earlier ones, but considering all the problems we probably won't," Bahram Yufefzadeh of Nucomp Systems said. Nucomp, a service bureau in St. Paul, Minn., is switching to four System/34s to replace its System/3 Model 15D

Users at the other end of the waiting list seemed to have opposite feelings. One went as far as buying a better delivery date from a less anxious firm.

Others are asking IBM sales reps for improvements in delivery. Several said their requests have been met with some optimism by IBM.

Although DPers are generally miffed by the delays, the problems with the System/38 haven't sparked many defections from the IBM camp. The users seem to be staying loyal to IBM despite other vendors' attempts to lure them from the flock.

A New Hampshire electric machine vendor said he was bombarded by unsolicited offers from Wang Laboratories, Inc. and Hewlett-Packard Co. salesmen. A ploy to steal IBM business may work in this case; the DP manager said he is seriously looking at the HP 3000 CPU.

Two other users who decided not to continue a relationship with IBM went with Wang's VS2200 and Basic Four Corp.'s 730.

Although the *Computerworld* survey turned up a large number of users who plan not to accept delivery of the System/38, Dave Stein, an IBM analyst for the Gartner Group, said that may not be the case.

"We have no reason to believe IBM is suffering a great attrition of System/38 orders. However, by being a year late and missing its price/performance target by as much as 15%, IBM is throwing a damper on the System/38 euphoria of a year ago," Stein said.

Although the delays may have struck a note of fear in some DPers, Stein passed that off as being normal in light of the type of user ordering a System/38 — somewhat of a novice whose only DP experience has been on IBM's System/3 line.

Pointing to similar delivery and software problems on IBM's 360 line in the early 1960s, Stein said problems on systems that offer both innovative hardware and software are not uncommon.

Another area causing some confusion among users still interested in the System/38 is IBM's Dec. 18 announcement of additional memory sizes on both models.

Most users polled weren't aware of the additional memory sizes. Those who were for the most part didn't care.

Two DPers said they were concerned the added memory would be necessary to achieve the results promised with the original maximum main memory sizes. IBM, however, denied that, saying the additional memory sizes were planned since the System/38's original announcement.

Changes made to make the System/38 work properly aren't expected to take up additional main memory under normal applications, a spokesman added.

UNIX
FROM YOURDON

The UNIX Operating System, version 6, binary form is now available from Yourdon.

Single-user License for PDP 11/34 and 11/23: $2500; support: $500 annually.

Multi-user License for PDP 11/70, 11/45, 11/40 and 11/34: $20,000; support: $2,000 annually.

MARK PEARSON, (212) 730-5838

YOURDON SOFTWARE
PRODUCTS GROUP
1133 Avenue of the Americas, New York, N.Y. 10036

UNIX [illegible] PDP [illegible]

Labor Department Begins Hearings

Business Groups Deny Need for Privacy Laws

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — Several business groups assured the Carter Administration there is no need for legislation to protect employee privacy in the private sector, as hearings began here last week on corporate compliance with the Privacy Protection Study Commission's recommendations.

The January hearing was the first of a series of four that will be convened by the Labor Department around the country this winter to assess the impact of the commission's final 1977 report on private industry.

That report recommended remedial privacy legislation in areas such as medical and financial records, but urged that the confidentiality of employee records be guaranteed by voluntary industry action.

President Carter, in his April 2, 1978 privacy message to Congress, concurred with that last recommendation and instructed the Labor Department to initiate a series of hearings to gauge the extent of industry action to date [CW, April 9, 1978].

Scope of Issue

Opening Monday's session, Labor Secretary Ray Marshall defined the scope of the privacy issue in the U.S. by noting that "every time we apply for credit or insurance or a job, each time we consult a doctor or seek service from a social agency, we are faced with an array of inquiries, forms and investigations.

"Our personal, financial and medical histories are probed. Our job performance is carefully examined. And this information, relevant and irrelevant, accurate and inaccurate, is poured into a vast electronic storage system, which neither forgives nor forgets. It is all available at the push of a button to make vital decisions affecting our daily lives — often without our knowledge."

Following Marshall, Assistant Commerce Secretary for Communications and Information Henry Geller focused on the immediate topic by saying that employment privacy "is one of the most important privacy issues" because personnel records are so pervasive.

"It is not the result of any plot," he continued. It is simply the result of the way government and industry make use of modern computer and communications technology."

Statistical Measures

According to Secretary Marshall, the Administration does not expect "that these hearings will produce any statistically valid measure of our accomplishments."

But subsequent witnesses did their best to persuade the Administration that such statistics do exist and that they show a large degree of employer willingness to protect their employees' privacy. Positive action, they said, is progressing rapidly enough to obviate the need for congressional involvement in this issue.

Representatives of the Business Roundtable, the National Association of Manufacturers and the U.S. Chamber of Commerce described the undertakings of their separate privacy subcommittees and task forces and expressed the commitment of their memberships — representing thousands of firms employing millions of U.S. workers — to safeguard personnel records.

Several witnesses referred to various surveys and polls conducted recently, such as last year's Louis Harris and Associates poll [CW, June 11] and a yet-to-be-published American Management Associations survey, which show that U.S. corporations and workers are aware of the privacy implications of an information-intensive society.

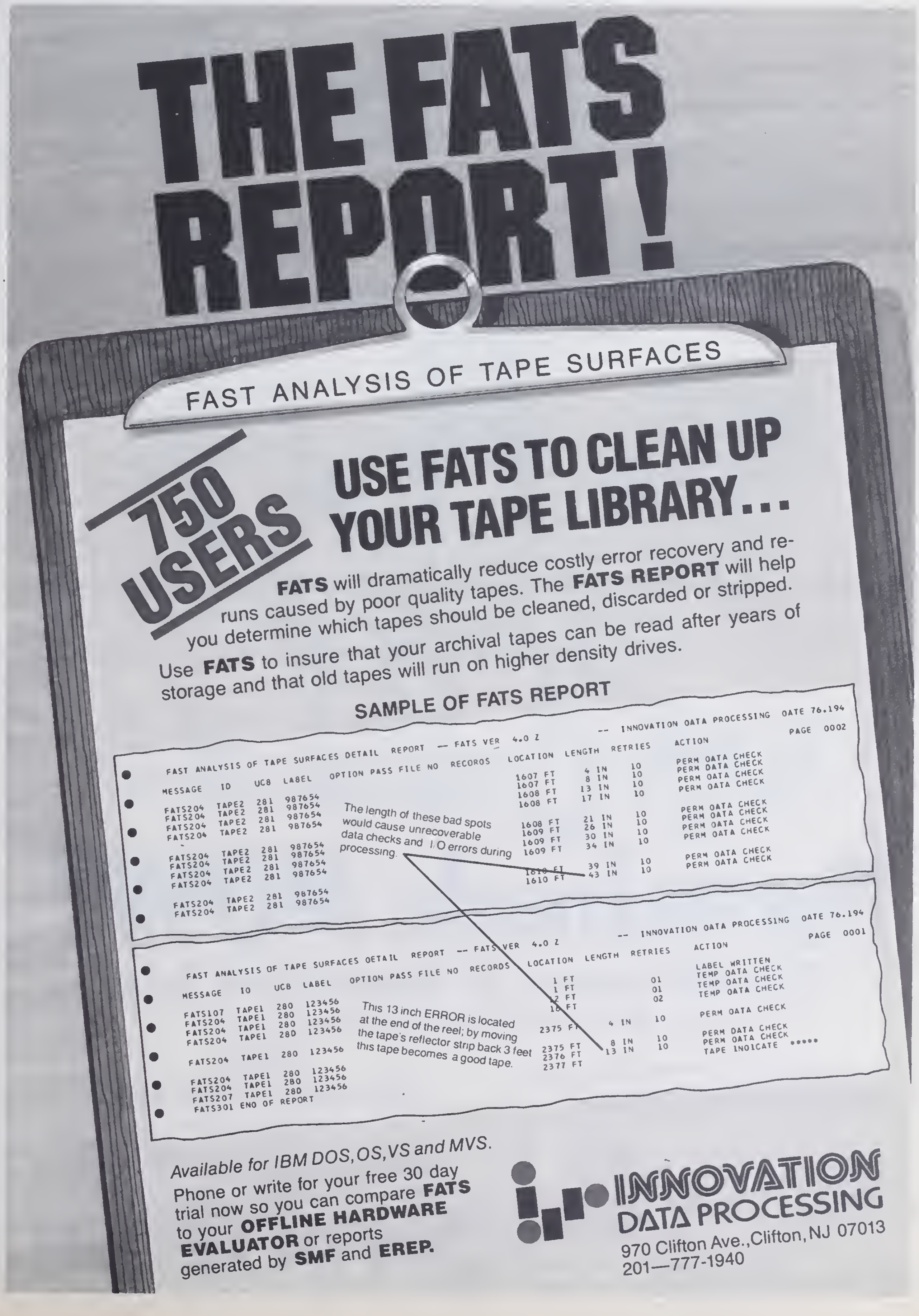
"Interestingly, all of these polls — while indicating a broad range of interest in privacy among respondents — seem to show that the privacy issue has not generated widespread public alarm, at least in the employee-employer relations," according to Robert Hawk, Director of Community and Regional Development, U.S. Chamber of Commerce.

Hawk and other witnesses referred to a recent statement of Dr. Alan Westin, professor of Public Law and Government at Columbia University and a consultant to the Harris poll, who said last month that "full-time employees as a whole in the U.S. are not burning with anger at their employers over invasions of personal privacy, nor do most employees believe that employers are engaged in improper or harmful practices in handling employee data."

While Hawk and other business spokesmen tried to illustrate that employee privacy is well left in the hands of the employer, Westin, himself a witness at last week's hearings, was not so optimistic.

"When you build sophisticated, automated records systems, you damn well better have rules" about collection, storage and dissemination of information, Westin said.

Additional hearings will be held by the Labor Department in New York City the week of Feb. 17, in Chicago the week of March 2 and in San Francisco the week of March 16.



THE FATS REPORT!

FAST ANALYSIS OF TAPE SURFACES

750 USERS

USE FATS TO CLEAN UP YOUR TAPE LIBRARY...

FATS will dramatically reduce costly error recovery and reruns caused by poor quality tapes. The **FATS REPORT** will help you determine which tapes should be cleaned, discarded or stripped.

Use **FATS** to insure that your archival tapes can be read after years of storage and that old tapes will run on higher density drives.

SAMPLE OF FATS REPORT

```
FAST ANALYSIS OF TAPE SURFACES DETAIL  REPORT  — FATS VER  4.0 Z   -- INNOVATION OATA PROCESSING  OATE 76.194
MESSAGE   IO     UCB  LABEL   OPTION PASS FILE NO  RECOROS  LOCATION  LENGTH  RETRIES   ACTION        PAGE  0002
FATS204   TAPE2  281  987654                                1607 FT    4 IN     10      PERM OATA CHECK
FATS204   TAPE2  281  987654                                1607 FT    8 IN     10      PERM OATA CHECK
FATS204   TAPE2  281  987654                                1608 FT   13 IN     10      PERM OATA CHECK
FATS204   TAPE2  281  987654                                1608 FT   17 IN     10      PERM OATA CHECK

FATS204   TAPE2  281  987654                                1608 FT   21 IN     10      PERM OATA CHECK
FATS204   TAPE2  281  987654                                1609 FT   26 IN     10      PERM OATA CHECK
FATS204   TAPE2  281  987654                                1609 FT   30 IN     10      PERM OATA CHECK
FATS204   TAPE2  281  987654                                1609 FT   34 IN     10      PERM OATA CHECK

FATS204   TAPE2  281  987654                                1610 FT   39 IN     10      PERM OATA CHECK
FATS204   TAPE2  281  987654                                1610 FT   43 IN     10      PERM OATA CHECK
```

The length of these bad spots would cause unrecoverable data checks and I/O errors during processing.

```
FAST ANALYSIS OF TAPE SURFACES OETAIL  REPORT  -- FATS VER  4.0 Z   -- INNOVATION OATA PROCESSING  OATE 76.194
MESSAGE   IO     UCB  LABEL   OPTION PASS FILE NO  RECORDS  LOCATION  LENGTH  RETRIES   ACTION        PAGE  0001
FATS107   TAPE1  280  123456                                                            LABEL WRITTEN
FATS204   TAPE1  280  123456                                   1 FT             01      TEMP OATA CHECK
FATS204   TAPE1  280  123456                                   1 FT             01      TEMP OATA CHECK
FATS204   TAPE1  280  123456                                   2 FT             02      TEMP OATA CHECK

FATS204   TAPE1  280  123456                                  16 FT

FATS204   TAPE1  280  123456                                2375 FT    4 IN     10      PERM OATA CHECK
FATS204   TAPE1  280  123456                                2375 FT    8 IN     10      PERM DATA CHECK
FATS207   TAPE1  280  123456                                2376 FT   13 IN     10      PERM OATA CHECK
FATS301   ENO OF REPORT                                     2377 FT                     TAPE INOICATE  *****
```

This 13 inch ERROR is located at the end of the reel; by moving the tape's reflector strip back 3 feet this tape becomes a good tape.

Available for IBM DOS, OS, VS and MVS.

Phone or write for your free 30 day trial now so you can compare **FATS** to your **OFFLINE HARDWARE EVALUATOR** or reports generated by **SMF** and **EREP.**

INNOVATION
DATA PROCESSING
970 Clifton Ave., Clifton, NJ 07013
201—777-1940

Users Name 44 To '79 Honor Roll

(Continued from Page 1)

335 packages rated by five or more users, as well as budget information supplied by many of the responding organizations. Suggestions on how to select software are also included.

Users rated each package in seven categories, using a four-point scale running from poor (1) to excellent (4). In addition to overall satisfaction, the categories were throughput/efficiency, ease of installation, ease of use, documentation, vendor technical support and training.

Users also rated each package on its advantages and disadvantages, on how quickly it performed as promised and whether modifications were necessary.

Packages which earned weighted average scores of 3.5 in overall satisfaction and 2.8 in throughput/efficiency, ease of installation, documentation and vendor technical support were listed on the Honor Roll. Datapro gave honorable mention to another 21 packages which met those scores but were rated by only five to nine users.

As in every year since the Honor Roll was started in 1973, systems-type software predominated with only Alltax, the tax calculation package, on the list to represent application programs.

In the Datapro charts reporting the results by category for each package, Datapro gave up its previous practice of showing the precise mathematical weighted averages. Instead, the researchers grouped ranges of scores into "letter grades" similar to report cards.

With that change, a vendor will be prevented from pointing to the fact that its product was "better" — perhaps by .1 of a point — than others.

In any case, Datapro was careful to point out that information in the report can be information "if used with discretion and with the understanding that there are many factors involved in selecting the right software package."

Datapro is at 1805 Underwood Blvd., Delran, N.J. 08075.

1979 Datapro Software Honor Roll

✱Seven-Time Member✱

Alltax — Management Science America, Inc.
Disk Utility System — Westinghouse Electric Corp.
Epat — SDI
The Librarian — Applied Data Research, Inc.
Panvalet — Pansophic Systems, Inc.

✱Six-Time Member✱

Easytrieve — Pansophic Systems, Inc.
Fast/Dump/Restore — Innovation Data Processing, Inc.
Quikjob — Systems Software Support, Inc.
Syncsort — Whitlow Computer Systems, Inc.

✱Five-Time Member✱

DYL-260 — Dylakor Software Systems, Inc.
1130/Fortran — DNA Systems, Inc.
RPG-II (360/370) — IBM Data Processing Division
Westi — Westinghouse Electric Corp.

✱Four-Time Member✱

CA-Sort — Computer Associates, Inc.
IDMS — Cullinane Corp.
SAS — SAS Institute, Inc.
Slick — NCI, Inc.
1130/Sort — DNA Systems, Inc.

✱Three-Time Member✱

Adabas — Software AG of North America, Inc.
Extended DOS — The Computer Software Co.
Flee/Flim — Goal Systems
Image/3000 — Hewlett-Packard Co.
Roscoe — Applied Data Research, Inc.
RPG-II (S/3) — IBM General Systems Division
Software 1040 — SAB, Inc.

✱Two-Time Member✱

BEM — Univac
Docs — CFS, Inc.
Faqs — Goal Systems
Shadow II — Altergo Software, Inc.
Sort (S/3) — IBM General Systems Division
TLMS — Capex Corp.

✱First-Time Member✱

Boost — Macro-4, Inc.
CP/M — Digital Research
Disk Space Manager — Westinghouse Electric Corp.
Dynam/T — Computer Associates, Inc.
FTL — Goal Systems
Logout — Macro-4, Inc.
On-Line Source Maintenance Facility — IBM General Systems Division
OWL — NCI, Inc.
RPG-II (S/34) — IBM General Systems Division
Scepter — Westinghouse Electric Corp.
Space/Manager — Altergo Software, Inc.
SRI/Edit — Systems Research, Inc.
Vollie — Applied Data Research, Inc.

U.S. Counterattacks in Standards Case

(Continued from Page 1)

denied, the court will then consider a motion by the plaintiffs for a summary judgment in their favor.

The government has also asked for a 90-day discovery period to obtain from the four firms and possibly third parties, such as the American National Standards Institute (Ansii), information on the activities of the companies during the development of the standards.

In its Dec. 19 filing regarding those activities, the government included affidavits from present and former National Bureau of Standards (NBS) officials, who attacked the four firms for obstructionist tactics and argued the companies have available to them adapter technology that would facilitate compliance with the standards. The mainframers have claimed it would take several years and millions of dollars to adapt their equipment to the standards' specifications.

In outlining its arguments concerning the plaintiffs' past behavior, the government said that "since they [the four firms] are seeking to invoke the court's equitable powers, it is appropriate to inquire into plaintiffs' conduct with respect to the subject matter of this lawsuit . . . .

"We have reason to believe that plaintiffs have intentionally sought to undermine or delay the implementation of any I/O interface standards, for the reason that such standards are not in the companies' best interest."

The government cited an affidavit of Thomas N. Pyke Jr., director of the Center for Computer Systems Engineering of the NBS Institute for Computer Sciences and Technology (ICST), who said that representatives of the four companies to the Ansi X3T9 (I/O standards) committee "consistently voted in such a way" as to delay or otherwise impede the timely development of standards.

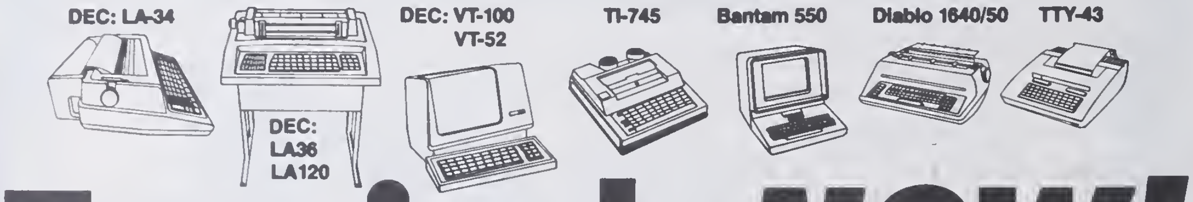
That charge was bolstered in an affidavit from Norman J. Ream, first ICST director and now a consultant still active in Ansi. Ream said a 1973 "abortive attempt" to block Ansi development of an I/O standard was led "by employees of the major computer systems manufacturers, including representatives of the plaintiffs."

Specifically, Ream said "the representative of Honeywell Information Systems, Inc., Mr. Robert M. Daly, stated to me in the 1974-1975 time frame . . . that his membership on the X3T9 committee was to prevent adoption of a proposed standard rather than to foster adoption of a standard."

Turning to the issue of adapter technology, the government said its decision to adopt the standards "was based in part on evidence demonstrating that adapters could be built and used effectively and without undue expense."

The government again cited the two affidavits, which claim that at least two of the four firms, Univac and CDC, have long had or could easily develop the technology to adapt their products to the four standards, again a claim the plaintiffs have denied.

Lastly, the government countered arguments that "these standards will terminate all of plaintiffs' business with the federal government, resulting in irreparable injury to their companies." The government noted that "smaller systems are expressly excluded" from application of the standards and that the four firms offer 42 "individual models or entire series of models of computers" that are exempt.



Terminals NOW!
3 Month Lease or Immediate Sale
Your single source for brand-name terminals.

Used Equipment Corner

ADDS Consul 580
only $695.
Quick . . . Quiet . . . Reliable

Call:
East: (617) 246-1665
P.O. Box 185, Lynnfield, MA 01940
West: (415) 461-0923
1100 Larkspur Landing Cir., Larkspur, CA 94939
QWIKTERM

Pressure From FCC Growing

Further Cuts in International Telex Rates Likely

By Phil Hirsch
CW Washington Bureau

WASHINGTON, D.C. — The 55 cent/min reduction in international Telex rates implemented last November by U.S. international record carriers (IRC) may be followed by another within the near future. This is one likely response of the carriers to growing pressure from the Federal Communications Commission (FCC) and from a new competitive threat.

Last month, the FCC released an audit showing that U.S. IRCs have been earning returns of 18% to 58% on their Telex business for some time. Simultaneously, the commission opened the international telecommunications market to additional competition.

The FCC ruled, for example, that Western Union Telegraph Co. could continue offering overseas Telex service via Canada and Mexico; it authorized AT&T to begin overseas Dataphone service and it required the IRCs to interconnect their Telex facilities with each other and with domestic Telex networks — thus enabling users to transmit Telex messages to any country through a single terminal [CW, Dec. 24].

A major aim of these moves is to create "competitive pressures" — new international services that can be substituted for existing ones — which will bring rates down.

Resale Issue

The commission also decided that Consortium Communications International (CCI) can continue to offer a cut-rate international Telex service if the company applies for a common carrier license. CCI, an international "communications management" company with an office in New York City, has been advertising rates for Telex service that are up to 60% below those charged by the IRCs.

A spokesman for CCI said last week that the company "probably" will apply for the common carrier license. While opposition from the IRCs is virtually certain, the spokesman said he doubts they'll be successful. "Based on what happened last month, the FCC clearly believes more competition is necessary in international communications," he pointed out.

In addition, the commission is seriously considering whether to allow the resale of international communication services. Based on their past behavior, the commissioners are unlikely to terminate CCI's offering, which is a resale service in effect, until this question is resolved.

FCC Chairman Charles Ferris has already indicated that he favors resale of international communication services. Last month, in a statement appended to the FCC's decisions, Ferris said "present restrictions on ... third-party uses of international lines" are one example of "issues ripe for reevaluation" by the commission.

Typical Rates

CCI is but one of a number of communication suppliers now providing cut-rate international Telex service to U.S. customers. Among the others are Via Titus, Inc. of Patchogue, N.Y., Southern Pacific Communications Co. and Western Union.

The rates charged by the telegraph company are typical of the others. To Austria, France, West Germany and Italy, for example, Western Union charges $1.75/min. The IRCs' rate is $2.50.

Western Union's cut-rate Telex service relies on Canada's CNCP Communications and Mexico's overseas telecommunications authority, Telecomex, to provide the international portion of the message path. They interconnect at the U.S. border with Western Union's domestic Telex network.

Last month, the FCC — overruling intense objections from the IRCs — decided Western Union could continue offering this service if the company files a tariff. The commission reinterpreted Section 222 of the Communications Act of 1934, which says basically that the telegraph company cannot offer international communications services.

Technically, according to the FCC, Western Union's new service is not international communications; rather, it is the domestic portion of such a service. Since Section 222 does not require the telegraph company to hand off overseas Telex messages to U.S. IRCs, the commission said, it does not prohibit Western Union from offering a joint service with CNCP and Telecomex.

The other companies offering cut-rate international Telex services employ different arrangements. Southern Pacific interconnects its domestic network with the computer in Patchogue operated by Via Titus. That company uses lines leased from the U.S. IRCs to transmit messages to a computer in London operated by VTL Data Processing Ltd.

CCI employs a somewhat similar scheme. Customers access its New York City offices via dial-up telephone or Telex. Messages travel via CCI-leased international circuits to affiliated computer centers in London or Tel Aviv, Israel, and are retransmitted from those points to their destinations over lines leased from a foreign carrier.

BDS for your DEC*

The BDS line printers are the best cost/effective answer for your DEC computer requirements. BDS offers a complete printer line of *High Quality, Latest Technology* and *Quick Delivery—30 days* in most cases.

The BDS printer systems, with *speeds of 200–1800 LPM* with Matrix, Band, Drum, and ChainTrain Technology afford you the diversification for your exact needs with *savings of 30–50%*!

BDS supplies the printer, controller and cable, you simply plug into your DEC system and go.

For more specifics from us we need some from you, please **call BDS** (415) 326-2115 or **send us the coupon.**

It will be money and time well spent.

(the following companies all have registered trademarks)

*** DEC**
*PDP8
*LSI-11
*PDP-11
*VAX-11/780
*DEC 20

- **BURROUGHS**
  B80/800
  B1700 thru B7800
- **DATA GENERAL**
  Nova
  Eclipse
- **HP**
  3000 SERIES 30, 33 SERIES
  3000, I, II, III SERIES
  250/300 SERIES
  1000, 21 MX SERIES
- **IBM**—SERIES 1
- **HONEYWELL**
- **TI - INTERDATA**

and most others

To: **BDS Computer Corporation**
1120 Crane Street
Menlo Park, CA 94025
(415) 326-2115
TWX 9103732005 (BDS MNPK)

The Computer System I Use________________
____
Name________________________
Title________________________
Company______________________
Street________________________
City__________State_____Zip_____
Telephone (   )________Ext._____

BE ON-LINE INSTEAD OF IN LINE

CONDOR...a dramatic, new system that allows immediate on-line access. At last, no more waiting in line for computer availability. CONDOR is designed to provide a complete range of program development capabilities to the application and system programmer. Easy to install and use, CONDOR meets the most complex needs of program development, while providing a wide array of convenient features that greatly enhance programming productivity.

No other system provides all these features to the user:

- CONDOR can be operated in any of the following environments: DOS/VS, VSE, DOS, DOS/MVT, DOS/RS and EDOS.
- A flexible system, CONDOR runs as a STAND ALONE system and as an application task under CICS/DOS/VS, CICS/DOS, SHADOW II, DATACOMM, BETACOMM, MINICOMM and SWIFT.
- CONDOR offers a unique new source library system, provides online access to the DOS system and private source statement libraries, as well as the LIBRARIAN and PANVALET master files.
- A powerful Full-Screen edit facility that permits a single enter key to request up to 38 different edit functions.
- Full facilities for Remote Job Entry and output retrieval under POWER/VS, DOS/MVT SAGE and for DOS users running with no spooler system.
- Advanced on-line utilities such as VTOC, DSERV, SUPERZAP, COREZAP, ALLOCATE and DASD.

For additional information and our 30 day trial, fill out the coupon below or give us a call.

NAME
COMPANY
CITY STATE ZIP
PHONE

PHOENIX COMPUTER CORP.
11949 JEFFERSON BLVD. · SUITE 103
CULVER CITY, CA 90230 · (213) 827-4500

Anything they can do, we can do better. And for less.

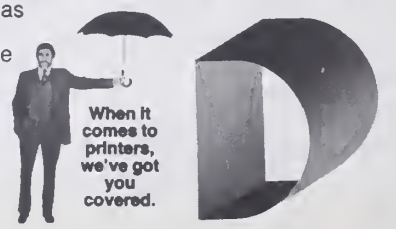
Being a third party vendor, especially America's largest independent source for medium and high speed line printers for minicomputer applications, gives us one distinct advantage over your minicomputer supplier: An almost limitless choice of printers. Let's face it, HP and DEC and all the rest can only afford to offer a limited range of printers. After all, their primary interest is the CPU they manufacture. But as your printer specialist, we can offer you the largest selection of printers available anywhere.

The Choice Is Yours. Letter quality Chain-Trains, heavy-duty Drums, high speed Charabands, or economical Bands, we can help you select the perfect printers for your application. We provide performance certified communications controllers, too, plus the installation and nationwide service you expect from us.

And For Less. Best of all, our volume purchasing power means that your printer is priced as much as 50% below list, and we can deliver right from stock or in as little as 30 days. We offer lease and rental plans, as well.

New installation or system upgrade, we're your best source for all-around value in minicomputer printers. Bar none. We're Digital Associates Corporation, 1039 East Main Street, Stamford, Connecticut 06902, (203) 327-9210.

Call toll-free, outside Connecticut, (800) 243-9054.


When it comes to printers, we've got you covered.

Ex-CSC, NCSS Employee Innocent of Fraud Charges

By Jake Kirchner
CW Washington Bureau

ALEXANDRIA, Va. — Peter Loux, a former employee of both Computer Sciences Corp. (CSC) and National CSS, Inc. (NCSS), has been found innocent of kickback and fraud charges connected with contracts the two firms had with the federal government.

The jury decision was handed down Dec. 29 in federal court here. Loux had been charged with 37 counts of fraud, conspiracy and kickbacks stemming from his work on CSC's $100 million Infonet teleprocessing services contract with the General Services Administration (GSA) and a National CSS contract with the U.S. Department of Transportation [CW, Nov. 12].

Co-defendants Icarus Corp., a Maryland computer consulting firm, and its president, Herbert G. Blecker, were convicted during the same trial on two counts of mail fraud and six counts of making false claims against the government, respectively.

Blecker could be sentenced to up to 30 years in prison and fined $60,000. The Icarus conviction carries possible fines of up to $20,000 and 10 years in prison or both.

Resumes Falsified

A special government task force investigating GSA fraud and corruption contended Loux had "steered" consulting work to Icarus as part of the CSC and NCSS contracts. Loux was said to have received kickbacks for that work, "laundered" through a "shell company," Data Processing and Technical Consultants, Inc.

Prosecution attorneys argued that Loux helped Blecker falsify Icarus employee resumes so Icarus could charge for more advanced education and longer years of experience than the employees true backgrounds warranted.

The jury agreed that Blecker had knowingly falsified the resumes and that his company had used the mail to bill the government for inflated consulting fees for Icarus workers. Loux was cleared of any complicity in those actions.

The jury also accepted defense arguments that payments made to Loux by Icarus were for "moonlighting" work Loux performed to help Blecker set up a marketing organization for Icarus's Cost software package — a program to help petrochemical firms determine in advance the cost of large manufacturing facilities.

Payments were made to Loux through Data Processing and Technical Consultants so Loux's employers — CSC and, later, NCSS — would not learn of his outside work, the defense said.

Loux's attorney told the jury that the defendant had never tried to hide the money from anyone other than his employers and that he had listed the income, exceeding $35,000 during one of the years covered in the indictment, on his federal tax returns.

Surprise Testimony

Loux's position was bolstered by the testimony of Paul Scanlon, president of Data Processing and Technical Consultants, the firm established, according to the indictment, only so it could conceal the payments from Icarus to Loux.

Scanlon had been given immunity from prosecution in exchange for his testimony and had been expected to back government allegations that the payments were kickbacks. Prosecution attorneys would not comment on Scanlon's surprise testimony.

Loux had faced possible penalties of up to five years in prison and $40,000 in fines for each of the 37 charges against him. Besides acquitting him of all charges, the jury found Blecker and Icarus innocent of the conspiracy and kickback charges against them.

Traub Leaves Carnegie-Mellon To Start Columbia Department

NEW YORK — Despite a worsening shortage of academic computer scientists in the U.S., Columbia University has established its own computer science department under the chairmanship of the former head of Carnegie-Mellon University's computer science program.

Columbia's hiring of Joseph F. Traub, a pioneer in computational complexity, may represent a challenge to the stature of Carnegie-Mellon, Stanford University and MIT as having — in the opinion of many observers of U.S. computer science — the nation's foremost computer science programs.

"I left Carnegie-Mellon to start a new department here because I'm convinced that Columbia has both the will and the resources to build a first-class center for research and learning in this field," Traub said.

Nevertheless, Traub indicated that efforts to build a front-running department will not be easy at a time when hundreds of U.S. academic positions in computer science are vacant because of the extent to which researchers in the field have left universities for jobs in industry [CW, Sept. 17].

"The number of outstanding researchers in computer science is so small that it may prove impossible immediately to make appointments meeting the high standards we intend to impose," Traub said. "In that case, funds from unfilled positions will be used for visiting and adjunct professors."

Thirteen faculty positions are authorized for the new department, including the Edwin Howard Armstrong Professorship held by Traub and the Julian Clarence Levi Professorship of Mathematical Methods and Computer Science, a post yet to be filled.

Traub has a Columbia Ph.D. himself. After directing a Bell Laboratories research group, he was Carnegie-Mellon's computer science chairman from 1971 until returning to Columbia last September. His research goal continues to be "the creation of a science of algorithm design."

Mainly for PDP-11 Sites

Training Planned for Unix Users

By Jeffry Beeler
CW West Coast Bureau

SACRAMENTO, Calif. — Users of Bell's Unix operating system can reportedly learn how to squeeze the optimum performance from their software during a training program scheduled to begin later this year at RKA, Inc., a systems house and consulting firm based here.

RKA is developing the program partly to fill the training vacuum created by Bell's decision to offer Unix without support, according to the systems house's marketing manager, Paul Cubbage.

"Unix systems are now being sold much faster than people are being trained to operate them," Cubbage observed. "As a result, people who truly know how to use Unix are at a premium."

In fact, at many Unix installations only one DP staff member can claim proficiency in the operating system, even though every user of the product should have at least three such experts just in case, Cubbage said.

For Managers, Programmers

RKA will aim its training program mainly at DP managers and programmers whose installations use Digital Equipment Corp. PDP-11 series processors to perform standard commercial applications. Most of the program's enrollees will qualify as "beginners or advanced beginners" in Unix programming, Cubbage predicted.

Expected to begin sometime during the middle of this year, the training program will initially consist of a series of three- to five-day seminars to be held consecutively in six major U.S. cities. The most probable sites for the seminars include New York City, Atlanta, Chicago, Boston, Los Angeles and San Francisco.

Exact details of the seminar schedule will be released in the coming weeks, RKA officials said.

Typical Seminar

A typical training seminar will start with a one-day overview exploring Unix's underlying philosophy. Such an overview would reveal Unix's potential advantages for its users and thus prove of interest primarily to DP managers, an RKS source explained.

The rest of the seminar would consist of a detailed technical discussion of Unix's major elements and, as such, would appeal mainly to programmers, the spokesman added.

Some of the topics covered during the final days of each seminar will include techniques for implementing files, a discussion of C (Unix's Pascal-like programming language) and a general description of the operating system's "kernel."

More information about the Unix training program is available from RKA at Suite 102, 650 University Ave., Sacramento, Calif. 95825.

DP Auditors Set Spring Meeting

SAN FRANCISCO — The 10th Annual Computer Audit, Control and Security Conference will be held here April 28 - May 2.

Sponsored by The Institute of Internal Auditors, the conference will feature state-of-the-art developments in assuring the integrity of information systems.

The schedule will include 10 tutorials, three general sessions, 30 parallel talks (each repeated) and problem-solving discussions.

Topics Outlined

Topics to be addressed include data base, distributed systems, data communications, software integrity, computer fraud and performance evaluation. Also discussed will be risk analysis, disaster recovery and techniques for the audit, control and security of information systems,

As keynote speaker, B.O. Evans, corporate vice-president of engineering programming and technology at IBM, will provide an information systems technology update and a look into the future for security professionals.

The registration fee is $550 for four days and $650 if an optional initial day of tutorials is included.

More information is available from the Conference Registrar, The Institute of Internal Auditors, 249 Maitland Ave., Altamonte Springs, Fla. 32701.

Comsat Circuits May Be Cheaper

WASHINGTON, D.C. — A 5% rate reduction for international satellite communications channels is likely to become effective Feb. 1. Besides voice and video channels, the reductions will also apply to Digisat and other circuits employed for data transmission.

Communications Satellite Corp. (Comsat), which leases these circuits to U.S. international carriers, said the saving will amount to $6.6 million annually.

A Federal Communications Commission source indicated that if the flowthrough to end users isn't adequate, the commission will apply pressure.

Done anything nice lately for your Digital computer?

Like adding another disk drive, more memory, a magtape subsystem, video display terminal, printer, multiplexer, paper-tape reader?

If you are an end user with a PDP-8, or any one of the PDP-11/05, /10, /35, /40, /45 or /55 series of processors, touch bases with us for current add-on equipment, new prior-generation equipment, or factory-refurbished equipment. All warranted, all eligible for field maintenance. Most available off-the-shelf. We'll even gift wrap.

Surprise your computer tomorrow. Call us today on 800-258-1728*, complete and mail the coupon to the address below or contact your local Digital sales office.

*8:00 AM to 5:00 PM, EST, Monday through Friday. New Hampshire, Alaska and Hawaii Residents dial (603) 884-7240.

☐ Please call me, I have an immediate need for the following:
    ☐ PDP-11 packaged systems
    ☐ Memory
    ☐ Mass storage
    ☐ Printers
    ☐ Terminals
    Other ____________

☐ Please send me information on the following:
    ☐ PDP-11 packaged systems
    ☐ DIGITAL factory refurbished equipment

Name: ____________
Organization: ____________
Address: ____________
City: ________ State: ____ Zip: ____
Phone: ____________

B-1-14-0

Digital Equipment Corporation
Traditional Products
522 Amherst Street
Nashua, New Hampshire 03060

digital

Policy Paper Slated for Discussion

Europe Moving to Protect Faltering DP Industry

By Rex Malik
Special to CW

LONDON — European countries will consider strong measures to protect their faltering computing industry, according to a policy paper slated for discussion by heads of government of the nine countries of the European Community. The measures include:

- Community preference.
- Specialized agreements between companies.
- Use of the financial clout of large European international funds.
- Transnational projects.

The measures are necessary because the uncoordinated, individual undertakings pursued by individual European nations in the computer field cannot compete with the efforts of the U.S. and Japan, the policy paper states.

Only in the area of telecommunications and software does the 60-page document note a relatively strong position for European firms. The study finds that the European telecommunications industry supplies 30% of the world market, with two-thirds of this market accounted for by wholly European suppliers.

Otherwise, the picture is somber:

- *Large systems* — Europe virtually satisfies its own needs, but its leading firm — ICL, Ltd. — is eighth in the world and hardly more than one-twentieth the size of IBM.
- *Peripherals, terminals and minicomputers* — Europe's share of the world market decreased from one-third in 1973 to one-fourth in 1978.
- *Components* — Europe's share of its own integrated circuit market is barely 10%.
- *Information industry* — "While more than 600 data bases of all types can be consulted in the U.S. through simple access systems set up by industry, Europe has at present very few of these services, many of which are, in any case, of American origin," the paper said.

"The world leadership of the U.S. industry owes much to the innovative Continental market in which it flourishes, to the immense procurement power of the U.S. federal government and the massive financial support which defense and space programs have given to research and development in all branches of electronics," the paper said.

Dangerous Situation

The document warns that if Europe continues existing uncoordinated policies, "the opposite of what the member states and their industries are trying to create" is likely to occur:

Europe will finally lose control over an essential field; the competitive position of the Community will be damaged both in Europe and worldwide; many potential new jobs as well as independence in decision making will be lost.

Failure to adhere to Community preference wherever possible means "benefits to be derived from the creation of the market will be enjoyed by undertakings outside the Community."

Competition policy should allow for specialized agreements between companies and should take account of the objective pursued, the document said.

The Community's financial instruments — including the Social Fund, the European Regional Development Fund and the European Investment Bank, — can be supplemented if necessary by specific measures chargeable to the Community budget, the paper suggests. A cooperative policy of public sector procurements would offer Community undertakings equitable opportunities to compete in qualitatively and quantitatively significant markets.

Call for Harmonization

Transnational projects that should be considered include harmonization of services on new digital networks starting in 1983.

In keeping with this, the postal, telegraph and telephone (PTT) agencies should begin to enlarge their potential sources of supply effective 1981, and equipment purchases should be harmonized starting in 1985. By 1985, PTTs should be purchasing on a Community rather than a national basis, and there should be an end to the protection of individual national markets from suppliers in other Community countries.

The Commission wishes to see equipment and systems harmonized. It recommends that the administrations of the nine countries should, from 1983, buy equipment and software only when it conforms to common standards.

Other proposals of the commission are:

- The exchange of data in the field of international trade requires harmonization of terminologies and creation of data communications standards.
- In order to permit expansion on a Community scale, electronic funds transfer between financial institutions requires a standardized system of personal identification, as well as technical solutions to the problem of data protection.

In the area of microelectronics technology, the Commission is currently

(Continued on Page 14)

data 3...
the specialists

In GSD

Because we deal exclusively in Systems 3/32/34/38, we have these advantages over other third party sources:

- A large inventory of most GSD equipment
- Individual machines, features and upgrades as well as complete systems
- A proven record of on-time delivery
- Staging and testing of all systems, including successful running of all IBM diagnostics prior to shipment
- All equipment guaranteed eligible for IBM maintenance agreement

In Service

You can get GSD equipment from other sources. The real difference is service. That's why we:

- Configure the system to your exact requirements, in our own facilities, with our people under our supervision
- Refurbish and repaint all equipment to the color of your choice
- Offer a maintenance agreement alternative below IBM rates
- Arrange all aspects of shipping and handling, including in-transit insurance
- Provide long or short term lease plans to suit your needs

But don't just take our word for it. Call us toll-free at 1-800-328-3537 and we'll provide you with the names of our customers in your area.

They'll tell you that it pays to deal with specialists.

Meet these specialists

This is **Russ Adams,** a specialist in **System 3,**

currently offering...

Machine Type	Description
S/3/6	16K, 4 9 or 9.8 mb, 85 cps (2)
S/3/7	16K, 4.9 mb
S/3/8	16K, 9.8 mb, 300 lpm, 3741
S/3/10	ANY CONFIGURATION
S/3/12	64K, 300 & 600 lpm, 3340
S/3/15	ANY CONFIGURATION
5444	Disk Drives for Mod. 6/8/10
5445	Disk Drives for Mod. 10/15
5203	200 and 300 lpm Printers
1403	600 lpm Printer
3741	Data Stations
3742	Dual Data Stations
3411/3410	Mag Tape Drives
3340	DASF
3344	DASF

This is **Gene May,** a specialist in **System 32,**

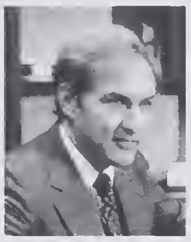
currently offering...

IBM SYSTEM 32

Configure your:
Main Storage Size — to 32K
Printer Speed — to 285 lpm
Disk Capacity — to 13.7 mb
3741 Data Station
3742 Dual Data Station

Call to Discuss **Your** Need

data 3 Buys System 32's Purchased or Rental Credit



This is **Loren Page,** a specialist in **Systems 34 & 38,**

currently offering...

Machine Type	Description	Date Available
5340-C23	64K/2D/27 mb	Jan./Feb./March
5340-D34	96K/DMag/ 64 mb	Jan./Feb./March
5340-E35	128K/DMag/ 128 mb	Jan./Feb./March

The above systems can be new or pre-owned and can be configured with peripherals in any appropriate combination to suit your needs.

Machine Type	Description
5211-002	Printer, 300 lpm
3262-B01	Printer, 650 lpm
5251-011	Display Station, 1920 char.
5251-012	Display Station, Com.
5256-003	Printer, 120 cps

data 3 computer corporation
114 Central Ave. • P.O. Box 266 • Buffalo, MN 55313
Toll-free 1-800-328-3537 • In Minn., call 612-682-4884 collect

Member
Computer Dealers
Association

Justice, IBM Making Little Headway in Talks

By Connie Winkler
CW Staff

NEW YORK — Settlement talks between IBM and the Justice Department's Antitrust Division — after three sessions, including one in late December — have yet to get down to substantive matters, according to sources on both sides.

The negotiators met a third time Dec. 20, after which IBM corporate issued the following statement: "Based on the discussions held so far, no one should be optimistic about settlement of this case in the foreseeable future."

This is the first time the Armonk, N.Y., offices have responded to questions on the settlement meetings with any more than "no comment."

A Justice spokesman said the December discussion again focused on procedure, and substantive matters only in the context of procedure. Previous meetings on settling the five-year antitrust trial were Oct. 10 and Nov. 6.

The talks were instigated by a Second Circuit Court of Appeals judge when IBM asked to have the district court judge David N. Edelstein pulled off the case because of his bias against IBM.

Attorney General Benjamin R. Civiletti has headed the negotiations for the Justice Department, and IBM has enlisted noted Washington, D.C., lawyers Clark Clifford and Paul Warnke.

Hostages May Get IBM Lawyers

NEW YORK — Cravath, Swaine & Moore lawyers are studying plans for defending the Iranian hostages, but the special assignment has not affected the U.S. vs. IBM antitrust case, according to Cravath attorney and IBM head counsel Thomas D. Barr.

Barr said Cravath lawyers had been working on the Greyhound Computer Corp. vs. IBM case when they were pulled over to preparing contingency plans if the hostages in Iran are put on trial.

Cravath is one of four prestigious firms working on the hostage question, apparently at the behest of the U.S. State Department. The request to the firms was through the Lawyers Committee for Civil Rights Under Law.

Cravath has been busy taking depositions for the retrial of Greyhound Computer Corp. vs. IBM, which is scheduled for April in Phoenix Federal District Court before Judge William Copple.

Barr said he informed Greyhound lawyers of the Iran delay.

Barr is expected to head the trial team for IBM in the Greyhound second go-round. In July 1972 there had been a directed verdict for IBM after the presentation of Greyhound's case, but before IBM's defense. Greyhound appealed to the Ninth Circuit Court of Appeals, which in August 1977 ruled the computer leasing case should be retried.

West Coast Meet To Cover DP Law And Software

SAN FRANCISCO — The Computer Law Association will present its fourth West Coast Conference — "Computer Law: Developing, Marketing and Acquiring Software" — on March 20 and 21, 1980 at the Sir Francis Drake Hotel here.

The day-and-a-half conference will examine legal problems and developments in the computer software arena from the perspectives of the developer, marketer and user.

Sessions will cover commercial and consumer markets, the problems of the OEM marketplace and specific end user concerns.

Although primarily of interest to those in the legal profession, the conference is open to anyone. Further information can be obtained by contacting Richard Bernacchi, Irell and Manella, Suite 250, 19 Corporate Plaza, Newport Beach, Calif. 92660.

COMMAND PERFORMANCE

The DOS / MVT operating system is definitely in a class by itself. It performs to rave reviews, day in and day out on 360's, 370's and PCM's.

In the world of software it has long been recognized that the best is produced by the quality-conscious, independent firms concentrating on their specialty.

Every facet of DOS / MVT is top quality; from the professionally assisted installation and conversion to the complete, flexible, easy to use, smooth-running fibre of the system itself.

A complete replacement for DOS / VS, DOS / VSE, DOS, EDOS, EDOS / VS and other comparable systems, DOS / MVT provides 12 dynamic region support, library management, procedure support, an outstanding SAGE Spooler and hundreds of other features.

A command performance — at a reasonable price.

Send for information today.

SOFTWARE PURSUITS, INC.

Send me information on DOS / MVT
COMPANY ____
NAME ____
TITLE ____
STREET ____
CITY ____ STATE ____ ZIP ____
PHONE ____
CURRENT OPERATING SYSTEM ____
C.P.U. ____

SOFTWARE PURSUITS, INC.
Spear Street Tower • Suite 2008
One Market Plaza
San Francisco, CA 94105
(415) 777-9529

1978 datapro HONOR ROLL

Systems House Building Turnkey for Dentists

By John Rhea
Special to CW

McLEAN, Va. — Computer Solutions, Inc., a systems house here, is putting together a turnkey medical billing system in an attempt to meet the requirements of more than a dozen dentists caught in the financial collapse of entrepreneur Sanford B. Schupper.

The dentists, from Virginia, Connecticut, Massachusetts. New Jersey and other eastern states, had ordered the systems at prices ranging around $20,000 each from Schupper's organization, Medi/Serv/Denti/Serv of Brookline, Mass. That company failed last March, and its assets were bought the following month at a sheriff's sale by its principal creditor, Medical Funding of Cincinnati.

The systems never became operational, largely for lack of operating software, and now Computer Solutions is trying to pick up the pieces. Sam Lofthouse, president of the company, bought the business from Medical Funding for a reported $550,000 and says he has been able to retain "more than half" of the original customers.

The systems are assembled by General Robotics Corp. in Hartford, Wis., the original system integrator for Schupper and another of his creditors. The prices are essentially the same - $18,900 for an entry-level model using floppy disks and $30,000 for a larger, cartridge-based system.

Sandra L. Young, Schupper's former vice-president for applications and now an independent software consultant in Natick, Mass., has been retained to fix the software package.

Lofthouse maintained that the systems are nearing operational status and that only "cosmetic" changes remain. He also claims to be selling them to other medical customers at a rate of 200 a year.

Vendor Blamed

The turnkey medical billing system, originally based on the Digital Equipment Corp. PDP-11 and later switched to the LSI-11 microcomputer when that became available, has had a stormy career since Schupper entered the industry in early 1977. He originally tried to buy a company known as Mediserv and owned by Herb Kugall, also in Brookline. When Kugall refused him, Schupper opened his own business in the same building under the names of Denticare, Mediserv/Dentiserv, Mediserv of Massachusetts and Dentiserv.

Schupper has been the target of several lawsuits and criminal actions stemming from his financial irregularities and has since moved to Mission Viejo, Calif.

Before his fling in the computer industry, he had attempted to operate air charter services. Those enterprises also wound up in the courts.

In a recent telephone interview with *Computerworld,* Schupper denied any intent to defraud his customers and placed the blame for his failure on DEC's inability to deliver the necessary hardware. However, former associates said his expensive living style and inability to manage money were the cause of his downfall.

Schupper conducted his business by flying around the country in private jets, paying for them with checks that bounced. Other eccentricities included carrying a gun at all times.

Among the organizations suffering financial losses from the collapse of Schupper's operations were leading OEMs, including DEC, Pertec Computer Corp., Qume, Dataproducts Corp., Mostek Corp. and Plessey; the system integrator, General Robotics; various banks in the Boston area, New York and Wisconsin; his former employees, who are suing to recover unpaid wages; and the dentists, who have either lost their original investment or will have to pay more to get their systems running. Federal Bureau of Investigation offices in Milwaukee and in Alexandria, Va., are conducting an

(Continued on Page 15)

Europe Moving To Protect DP

(Continued from Page 12)

preparing proposals for projects that will involve joint financing. These will be put to the Community's Council at the start of 1980.

The proposals cover two areas: highly specialized industrial equipment used in integrated circuit manufacturing and development of new computer-aided techniques for circuit design and testing.

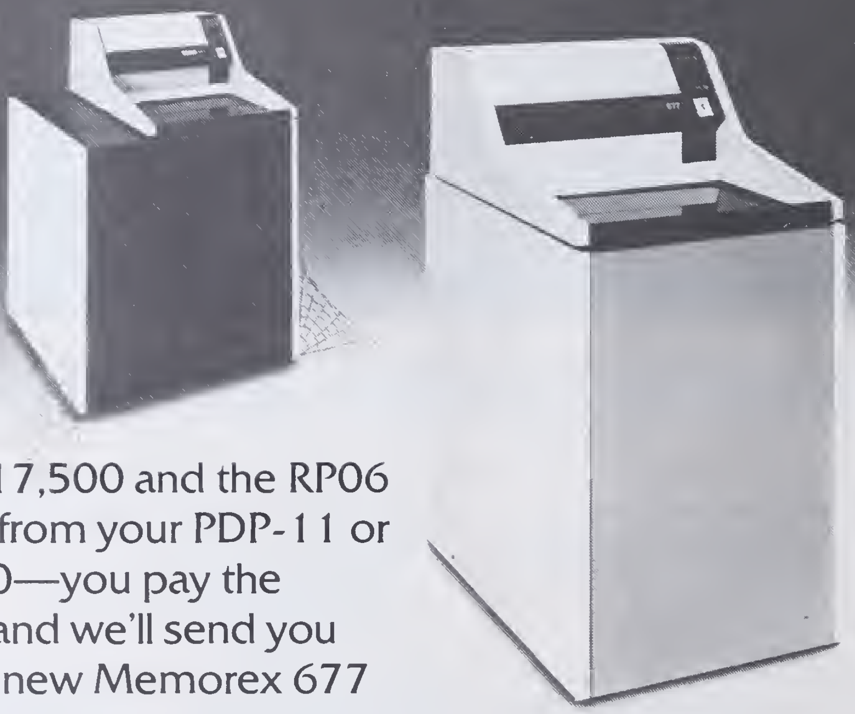
The Commission also recommends that it be used as a test bed for integrated on-line services. It proposes integrated Communitywide services covering its own institutions.

The proposed system will seek to eliminate the transmission of documents wherever possible and to start providing members of the European Parliament with direct access to Commission-held information.

The document also seeks coordination in research into the social consequences and effects of the use of information technologies.

The policy proposals were requested by the heads of government at a meeting of the Commission of the European Community in Strasbourg, France, last year and were due for discussion at its November meeting in Dublin, Ireland. However, other matters intervened.

Double Your RP06 Capacity For Half DEC's* Price



Send us $17,500 and the RP06 Disk Drive from your PDP-11 or PDP-11/70—you pay the shipper—and we'll send you two brand new Memorex 677 Disk Drives.

What's in it for you?
Plenty! For openers, you're getting two brand new 176-megabyte disks for less than half the price of a second drive from DEC; you're getting quality products from the same manufacturer that supplies the RP06 to DEC, Memorex Corporation; and you're getting totally plug and media compatible hardware.

What's the catch?
There isn't any; the two 677's we supply completely replace the unit you send us without any modifications. If you're thinking the "sting" is in the software, forget it, our two Memorex disks will play your software exactly like your old DEC drive without any software changes either.

Media compatible?
You bet! As a bonus, you can also play your disk packs on our drives.

Want more megabytes?
If 176 megabytes more storage isn't enough, send us $32,500 and your RP06—you pay the shipper—and we'll send you three new Memorex 677's for a total of 528 megabytes. Want more? Or you've got nothing to trade? Just send us $15K apiece and we'll send you as many 677's as you want.

If you think this is a put-on, call us; we'll tell you how we do it, and answer questions you have on installation, service, and other DEC hardware.

(408) 732-4523

West Coast Computer Exchange Inc.
Your second source for DEC equipment.
248 Sobrante Way, Sunnyvale, CA 94086
Telephone: (408) 732-4523 (408) 732-4524

*PDP and DEC are registered trademarks of Digital Equipment Corporation.

Hurt When Schupper's Empire Collapsed

(Continued from Page 14)

investigation.

As documented in papers filed with the Norfolk County Superior Court in Dedham, Mass., the Schupper empire collapsed after Medical Funding discovered that accounts receivable the Cincinnati firm had bought from Schupper for factoring were not genuine.

From July 5, 1978 to Jan. 17, 1979, according to the court papers, Schupper presented to Medical funding accounts receivable totaling $1,143,842.79 to be factored at 80%, thus yielding $833,733.59 to Schupper. The receivables were said by Schupper to be for dental DP services performed by one of his companies, Denticare, but the suit filed by Medical Funding on Feb. 15 charged that the invoices "were in fact false and did not represent accounts receivable to Denticare" and that Denticare was "a sham corporation which was caused to be incorporated . . . for the purpose of defrauding the plaintiff."

Out of the gross purchases of $1,143,842.79, the court papers show, Medical Funding recorded receipts of $442,685.01. With the addition of reserve accounts of $39,899.70 and $4,356.95, it was left with a shortfall of $656,901.13. The company sought an additional 10% penalty, or $65,690.11, for a total claim of $722,591.24.

Assets Seized

A subsequent court judgment in March seized Schupper's assets, including $200,000 worth of hardware at the General Robotics plant and in storage at Airborne Freight Corp. in Revere, Mass. The papers note that Schupper attempted to have that material transferred elsewhere in violation of the court order.

Schupper was not indicted for mail fraud, according to sources, because he sent all the bogus accounts receivable to Medical Funding via air courier.

The court also seized Schupper's house estimated to have a market value of $135,000 and other personal property.

The DP equipment in Wisconsin and the other Schupper properties in Massachusetts were subsequently sold at sheriff's auction to satisfy the claims of Medical Funding, which also took possession of the house, and of the Grafton, Wis. State Bank, with which Schupper did his banking business upon the recommendation of Carl Pick, president of General Robotics. Medical Funding then sold the business to Computer Solutions.

Medical Funding was protected, according to sources, because that firm had liens on the equipment in the form of uniform commercial codes, which the OEM vendors did not have. Lawrence Horowitz, Medical Funding treasurer, refused to comment on his firm's role in the affair, but other sources questioned the legality of Medical Funding seeking Uniform Commercial Codes at a time when it was also suing Schupper for fraud.

The equipment was drop-shipped by the OEM vendors to the General Robotics plant near Milwaukee, according to Pike, and then installed in the dentists' offices.

Equipment believed to have been on hand at the time the assets were seized March 5 included more than $100,000 worth of the LSI-11 based CPUs, about $30,000 each worth of solid-state memories from Mostek and Plessey, at least $100,000 worth of cartridge disk drives (600 Model 3481s) from Pertec, at least 60 floppy disks from Qume valued at $30,000 and an undetermined number of printers from DP.

Since the companies involved had not filed for Uniform Commercial Codes, they were not entitled to recover either any payment for the equipment or the equipment itself.

Pick said he recognized early that Schupper's operations might be financially unstable and imposed relatively stringent credit terms, initially net 10 days and later solely cash on delivery. Pick placed his firm's losses at about $20,000, adding that they could have been catastrophic and that General Robotics at least salvaged an outlet for its integration business by performing the same functions for Computer Solutions.

Schupper Blames DEC

When contacted by telephone at his California home, Schupper blamed the failure of his companies largely on DEC's inability to ship him the equipment he needed on time. He said he had tried to talk to DEC President Ken Olsen, but was unsuccessful.

Schupper is willing to take what he called "the ultimate blame" for the failure of his ventures, but said that in retrospect he is guilty of nothing more than poor management. Failures of this kind are common in the computer business when companies are trying to develop new technologies while lacking sufficient capital, he said, denying any intent to defraud his customers. That is what the FBI is investigating.

Other sources, including former employees and suppliers, while sharply critical of Schupper's business methods, substantiated his claim that he always intended to ship the products.

Schupper declined comment on the suit by Medical Funding, any of his financial arrangements with banks or his present financial status.

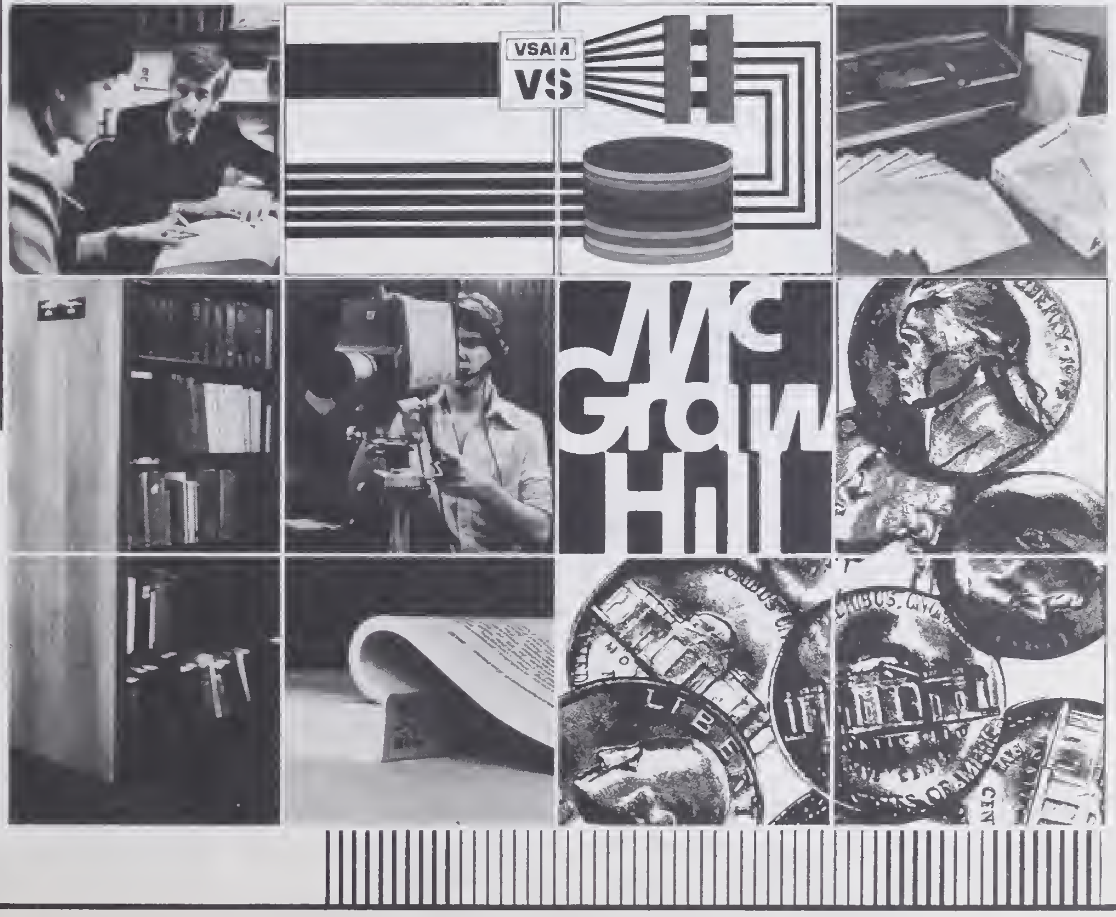
Your DP training is an investment!!

Make it a profitable one with the help of Edutronics/McGraw-Hill

Money spent on DP training is an investment. The expected dividend, of course, is an increase in efficiency and productivity. So why gamble with your money and your people. Invest in an organization with an international reputation, extensive resources and unlimited growth potential. Invest in Edutronics/McGraw-Hill. We can help make the most of your training investment today as well as tomorrow. Whether it's DP training in subject areas such as CICS, TSO, VSAM, MVS or even managerial training for DP personnel, we've got what you need. For more information on making the most of your DP training investment, write or call us toll free at 1-800-255-6324. We'll turn your investment into a profit.

Edutronics/McGraw-Hill
55 Corporate Woods, 9300 W. 110th St.,
Overland Park, Kansas 66210

Tell me more about an Edutronics/McGraw-Hill training investment
Name ______
Company ______
Title ______
Address ______
City ______ State/Province ______ Zip ______
Phone ______



Michigan State University Gains CAD Facility

By Jay Woodruff
CW Staff

EAST LANSING, Mich. — Michigan State University (MSU) has joined the small but growing number of schools that can afford to add computer-aided design (CAD) capabilities to their engineering schools.

Reduced costs and easily obtainable software are the major components that have permitted MSU to acquire CAD systems, once the costly and exclusive province of such firms as General Motors Corp. and Ford Motor Co., as well as the aerospace industry.

"Five years ago, the software and hardware were not readily available. Now software is routinely available that you can hang on a mini — a relatively new situation," Dr. James E. Bernard, director of the Case Center for Computer-Aided Design, said.

Next month, MSU will try to meet the growing demand for design time by upgrading from a 256K-byte Prime Computer, Inc. Model 400 minicomputer to the 512K-byte Prime 750. It will also double its disk capacity by adding another 80M-byte disk, according to Bernard.

Two Design Stations

Case Center's Design Station I uses eight Tektronix, Inc. 4006 display terminals and a Tektronix 4051 with 32K bytes, a matrix read-only memory and scientific subroutines. Tektronix also supplies a 4954 graphics tablet and a 4631 hard-copy unit, while a printer comes from Printronix, Inc.

Among the software used is Prime's Primos operating system and its UT200 remote job entry package, Tektronix Plot 10 and finite element software — Ansys from Swanson Associates and Gifts from the University of Arizona — for modeling.

At its second design station, the Case Center uses the same Prime computer, on which it runs a Tektronix 30-in. by 70-in. digitizer, using both in-house and outside-designed software.

Project Funding

MSU's facility was begun two years ago. Bernard, associate professor of mechanical engineering, said the school will spend $1,385,000 on the center by 1983. Intended to allow teaching and research in computer and graphics techniques for design and manufacturing, the center was launched with $200,000 in alumni funds after a one-year study to determine what was required for a computer-aided design and computer-aided manufacturing (CAD/CAM) facility, he said.

The costs are shared by the university and by government and industry having an interest in the program, according to Bernard.

In addition, the National Science Foundation has provided more than $220,000 for teaching CAD techniques to professors of engineering, physics and mathematics. The center recently acquired an Advent Corp. Model 1100 7-ft. (diagonal) screen television for instructing groups of up to 40 students.

The center connected the Advent to a Tektronix 4027 and maintains a link to the Prime CPU for demonstrations. "Then they go next door and do their homework," Bernard added.

Mark Zykin, a sophomore in mechanical engineering at MSU's Computer-Aided Design Case Center, checks the figures on a design problem.

CAD/CAM Curriculum

MSU's program is expected to produce graduates at the B.S., M.S. and Ph.D. levels, and all should have a working knowledge of CAD/CAM methods. At the B.S. level, undergraduates will take five three-credit courses, beginning in their junior year.

Those courses are Engineering Communications, including graphics, display and manipulation of data; Instrumentation Laboratory, discussing instrumentation for mechanical engineering applications and lectures and demonstrations of modal analysis; and three courses of Computer-Aided Design, which take the student from basic interactive graphics through advanced topics in CAD/CAM.

Because of its close proximity to auto manufacturers that use CAD/CAM extensively, Bernard feels that MSU's training puts its graduates in a favorable position when the manufacturers hire engineers. But he admitted that engineers are so scarce in the face of present demand that an engineering graduate is likely to be hired with or without CAD/CAM experience.

Although MSU can fund the CAD/-CAM program, it is not as easy to attract and retain a qualified faculty to staff it. Engineering graduates up to the doctoral level get paid more by industry than by universities, the director explained.

And yet, MSU has done pretty well in attracting faculty members, he added.

Monarch's
Unique, New
Terminal Mates™

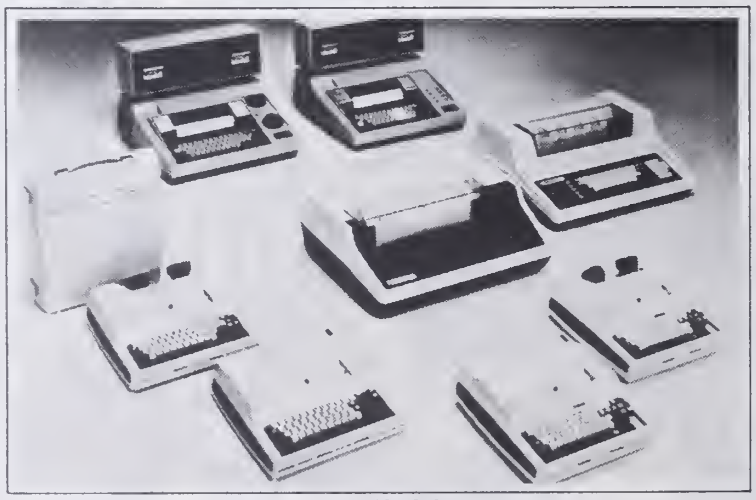
Give You
Savings in a SNAP.

Our unique interlocking system makes these handsome terminal stands snap together in 60 seconds, without tools, nuts or bolts. They ship flat, store flat. It all saves you money. Optional personal effects pouch. Immediate delivery. Terminal Mates™ (pat. pend.)—savings in a SNAP!

TERMINAL MATES™—*Monarch's First Product of the 80's*
MONARCH COMPUTER PRODUCTS, INC.
P.O. Box 4081, New Windsor, NY (914) 562-3100
For the name of your nearest dealer, call: 1-800-431-4958 (in New York, 914-562-3100)

data rentals/sales, inc.

We are authorized TEXAS INSTRUMENTS Distributors with a Complete Inventory



Also Available
TELETYPE 43 DECWRITER IV LSI ADM 3A 212A & 202S MODEMS

LOS ANGELES, CA (213) 559-3822
SAN FRANCISCO, CA (415) 364-4384
CHARLOTTE, NC (704) 552-8660
COLUMBIA, SC (803) 799-1805
ORANGE COUNTY, CA (714) 754-5770
ATLANTA, GA (404) 588-1813
FLORIDA (813) 934-0829
MIAMI AREA (305) 371-6355

OUTSIDE CALIFORNIA, CALL TOLL-FREE (800) 421-4505

Often More Expensive in Long Run

Hopper Warns of Staying Static

CW Photo by T Scannell

Hopper makes a point.

By Tim Scannell
CW Staff

BOSTON — By not examining every angle of a particular hardware or software problem, DP heads often forego seemingly expensive computer system changes that could save money in the long run.

"You'd be amazed how many times the cost of not doing something is more than the cost of doing it," Grace M. Hopper, a captain in the U.S. Naval Reserve, said.

Speaking before a large audience of both word and data processing executives here at a recent conference of Wang Laboratories, Inc. computer users, Hopper cited a number of common management pitfalls and stressed the need for corporate leaders to experiment with solutions that may seem to go against a company's procedural grain.

On the subject of saving money, for instance, the knowledgeable septuagenarian cautioned managers to weigh the benefits of installing a new piece of equipment or computer program against running with the existing computer set-up. As an example, she noted that the government spends about $450 million annually on software conversion, a price tag that could have been scissored if officials had originally elected to use standard high-level languages instead of a variety of codes.

Dangerous Cliche

Hitting closer to home, Hopper maintained that the most dangerous phrase in the DP management world is "but we've always done it that way." Just like clocks don't have to run clockwise to tell the time, managers don't have to make decisions along well-worn corporate lines, she said.

In addition, managers often assume that all of the data contained in a computer's files is correct and don't make allowances for inaccurate information. Part of the reason for this oversight is that companies don't usually compile figures on how much time or money keeping erroneous data will cost, Hopper stated.

The U.S. Navy, however, did conduct a study examining the financial dangers of harboring false data on military personnel, who can sue the government if this information prevents a promotion or creates other career obstacles. Taking an 8,000-file data base, Navy officials supposed that 4% contained some kind of potentially dangerous error.

After performing a number of risk analysis equations, the Navy found a chance of approximately 90% that these file errors will result in a negative management or command decision.

Assuming that 50% of these wronged individuals sue the government and are awarded about $2,750 — which the Navy estimated would cover the settlement and court and lawyer fees — officials discovered that their "small" percentage of file errors would cost the U.S. more than half a million dollars.

Taking management's responsibility a step further, into the 1980s, the DP veteran envisioned what computing might involve in the next decade and how the typical DP installation would operate.

Just as the pioneers didn't try to grow a bigger ox to handle larger work loads, Hopper quipped, manufacturers won't attempt to build larger and more powerful machines to perform more DP tasks. Instead, integrated networks of small computer systems will dominate the scene.

The Bank of America in California, for example, has prepared for the '80s by scuttling its large mainframe dinosaurs and installing a system of microcomputers and minicomputers to link its 1,100 branch offices there. Rather than spending about $16 million for one computer and $3 million for programming, the bank invested approximately $5.6 million on small computers and $1.5 million programming them for specific functions.

Stressing the need for more "common sense" in decision making, Hopper ended her speech by citing four criteria that managers will have to meet to keep afloat in the '80s. First, DP heads will more than ever be required to supply rapid and accurate information to other executives within a company; second, the computer system will have to operate consistently with virtually no downtime; third, the manager will have to almost guarantee the protection of a system's data, which is becoming more difficult to do as networks become more dispersed; and lastly, managers will have the responsibility of leading the youth of the world.

"They're smart, but no smarter than we were when we were their age," Hopper said.

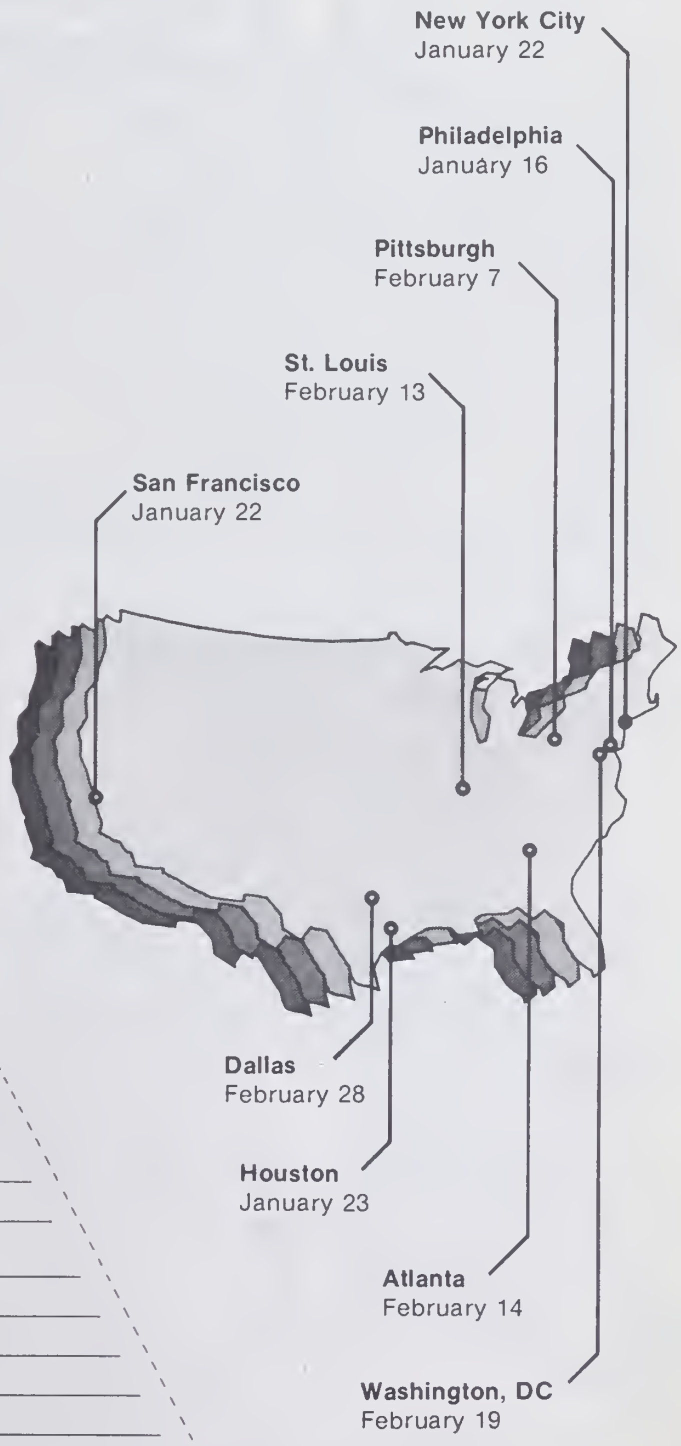
Boost DP productivity by 400%

- Develop new systems in 1/5 the time.
- Get new reports from any existing file in 1/40 the time.
- Introduce a genuine decision support capability.

RAMIS II lets you do all this. RAMIS II is the only product that integrates an English-like non-procedural language for report preparation and records management with a comprehensive DBMS.

At the same time RAMIS II provides significant, quantifiable cost benefits to an organization, it also offers DP and MIS departments a significant intangible benefit–By removing much of the detailed coding function, RAMIS II provides an atmosphere where the best people can do their best work.

You can use RAMIS II on your own IBM 360/370 or comparable computer, or on one of a dozen bureau networks on a usage basis.



Join us for a
RAMIS II Seminar
and find out more.

Call our toll free number
800/257-9576 or mail in the coupon.

Please register me for the free RAMIS II Seminar

at ____________________

on ____________________

Name ____________________

Title ____________________

Company ____________________

Address ____________________

City, State, Zip ____________________

Phone ____________________

☐ Please send me information on RAMIS II

MPG
Mathematica Products Group, Inc.
P.O. Box 2392 / Princeton, New Jersey 08540
C5

Expo '80 to Kick Off in San Mateo March 19

NEWTON, Mass. — Expo '80 will present its showcase of computer and office systems at regional conferences this spring and bring participants up to date on the latest in technology and information management.

The conferences will be held by the Conference Company in nine U.S. cities starting March 19-21 at the San Mateo (Calif.) Fairgrounds. On display will be small business systems, electronic mail equipment, software products, word processing systems, general information-handling equipment, CRT graphic systems and more, organizers indicated.

The Expo '80 conferences will also feature speakers addressing such topics as "Raising Business Productivity via Systems Technology," "Breaking the Office Paperwork Bottleneck," "Tomorrow's Office System" and "Computer Graphics for Scientific and Engineering Use."

After San Mateo, Expo '80 will move to Los Angeles' California Mart Convention Center on March 25-27; Dallas' Market Hall, April 1-3; New York's Coliseum, April 22-24; the Baltimore Convention Center, April 28-30; and Boston's Northeast Trade Center on May 6-8.

The series will continue at Detroit's Renaissance Center, June 3-5; Chicago's Merchandise Mart, June 10-12; and Cincinnati's Convention and Exposition Center, June 17-19.

The Conference Company can be reached at 60 Austin St., Newton, Mass. 02160.

Micro Course Available on Plato

MINNEAPOLIS — Control Data Corp. is offering to teach novice DPers the principles of microprocessing via its Plato computer-assisted education program.

"Microprocessors, a Short Course" is available at 20 Control Data Institutes or on terminals installed by the user's employer, CDC said.

The course is directed toward product designers and technicians. Learning is self-paced, meaning the employee must master a given segment of the course before the system will allow him to advance to the next segment.

The course features 25% Plato terminal use, 55% individualized study using text materials and 20% laboratory time. In the laboratory exercises, students are required to program and exercise an 8-bit microprocessor and related analog-to-digital and digital-to-analog devices, CDC said.

The CDC-developed course is divided into six areas: computer fundamentals; general microprocessor concepts; machine language programming; microprocessor architecture; interfacing; and an overview of microprocessor chip types.

The course costs $595. Group rates are also available, CDC said from Box O, Minneapolis, Minn. 55440.

ACM Forms Office Systems Interest Group

NEW YORK — The Association for Computing Machinery (ACM) has announced the formation of a Special Interest Group on Office Automation (Sigoa), dedicated to all aspects of applying computing techniques to office activities.

Open to all who care to join, Sigoa hopes to provide a nonpartisan meeting ground where substantive issues can be discussed and significant developments documented, according to a spokesman.

A bi-monthly newsletter, to be available at the Office Automation Conference in Atlanta this March, will be aimed at technical and managerial personnel directly involved with office automation.

Dues for the group are $7.50 for ACM members and $17.50 for nonmembers. Those interested in joining can contact ACM at 1133 Ave. of the Americas, New York, N.Y. 10036.

TAB'S UN·COLLATORS

Tab's Decollators and Bursters Deliver Versatile, Low-Cost Forms Handling
If your office has continuous forms, Tab Products can handle your printout decollating and bursting fast and without carbon mess. Whatever your forms handling needs, you can choose from Tab's wide range of decollators and bursters for increased forms handling output.

Tab's Mini to Maxi Bursters Handle Continuous Forms Fast!!
When you need forms burst and slit fast, the variable speed multi-processing 2470 Series Bursters and 2444 Mini Burster are Tab-engineered to handle all your requirements in one pass! Set-up is quick and easy.

Decollate in Minutes Without Mess!!
Tab's decollator series offer a variety of models, from the economical, compact 2420 2-Part Decollator Series for short run reports, to the more versatile, faster 2490 4/6/8-Part Decollator Series for handling continuous forms by the carton.

For more information about Tab's Forms Handling Equipment, write Tab Products Company,
2690 Hanover Street, Palo Alto, California 94304.
Or call (415) 493-5790.

TAB
PRODUCTS CO

Tab's 2476 Variable High Speed Burster with speeds of 0-350 feet per minute, slits, bursts, and neatly stacks forms in one pass without stopping machine.

Big jobs are handled faster with Tab's 2490 series, 4, 6, or 8 Part Variable Speed Decollator. One or both margins and carbons are removed at 475 ft. per minute in one operation.

Tab's table-top 2422 decollator handles forms up to 11" deep, 19" wide and is ideal for a mini-computer installation.

For larger decollating capacity, Tab's 2424 two-part decollator cuts your handling time by operating up to 450 ft. per minute.

The new Tab 2446 mini-burster features brush-feed slitters, safety cover with interlock switch, automatic jam detector, sequence stacker, and operates with variable speed from 0 to 200 ft. per minute.

Installing a Software System by January 1?

You need our help.

MSA

On October 15, Amoco Container saw our ad.

Today, they're in it.

The people at Amoco Container Company* are celebrating more than a new year. They're celebrating two brand new software systems and the short three months it took to install them.

It all started when they saw MSA's October ad and took us up on our offer to help. With the assistance of MSA and MSA's training aids, including audiocassettes, workbooks, and on-site training classes for data processing and user department personnel, Amoco actually implemented two of MSA's major Big 8™ systems in less than 90 days from the time they decided to do it.

So, while we're happy to have helped the dynamic people at Amoco, we'd be even happier to do it again. For anyone. Anytime. Anyplace. We can help you.

*Amoco Container Company, a subsidiary of Amoco Chemicals Corporation, is one of the largest manufacturers of blow molded polyester containers.

MSA

MSA has a software system that's on target for your application needs. Send in the coupon below and we'll get you off to a running start in 1980.

MSA

3445 Peachtree Road, N.E.
Suite 1300
Atlanta, GA 30326
attention: Robert Carpenter
404/262-2376

I am interested in the following MSA systems:

☐ Total Financial Management System—Big 8
☐ General Ledger/Budgeting—G/L 80
☐ Payroll/Labor Distribution
☐ Accounts Receivable
☐ Financial Forecasting & Modeling
☐ Fixed Assets/Property Control
☐ Personnel Management & Reporting
☐ Accounts Payable
☐ Supplies Inventory Control & Purchasing
☐ Procurement Matching

ADAPSO

COM-1/14/80

Name ____ Time ____
Company ____
Address ____ City ____
State ____ Zip ____
Telephone ____ Computer Model ____

Stance on OECD Draft Worries U.S.

France Balks at Transborder Privacy Guidelines

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — Concern is growing here that France will not abide by voluntary guidelines on the free international flow of information nearing completion within the Organization for Economic Cooperation and Development (OECD).

The draft guidelines, which for the most part reflect the U.S. position that no country should unnecessarily restrict transborder movement of data, have been forwarded to the OECD Council of Ministers with "reservations" on the part of several countries.

France, which has voiced the most serious objections to the document, is taking the position that personal data should not be transmitted to another country — the U.S., for example — unless the second country guarantees by law the confidentiality of the information, according to State Department officials.

While the U.S. has a number of privacy laws on the books, some kinds of personal records, such as personnel files, are protected only by codes of conduct — voluntary privacy policies implemented company by company.

If the French government does not soften its stance, certain types of data, such as banking records, probably could still be transmitted to the U.S. for processing because there are U.S. laws covering the confidentiality of financial records. But information such as personnel data on French employees of U.S. multinational corporations would not be allowed outside the country.

Resolution Possible

However, resolution of the French objections — as well as of additional, minor reservations on the part of Canada, Denmark and Norway — is possible before the Council of Ministers takes up the proposed guidelines, probably in February, according to Lucy Hummer, State Department assistant deputy adviser for management.

"I think that some reservations — the ones of countries other than France — will somehow fall out on the wayside and we'll be left with only the French reservations," she said.

"I think there is general agreement that these are essentially political questions remaining, which are really outside the scope of the [drafting group], that it takes people at the political level to try to work them out."

If the reservations are not resolved at the council level, the guidelines could be sent back for reworking, a process that would take an indefinite length of time. Alternately, the concil could vote to adopt the guidelines over the objections of France.

If the guidelines are adopted, it would be up to France to decline whether to honor them. The State Department is still optimistic that they will be approved by the OECD in February, Hummer said.

"Even if they're adopted with reservations, they still have a certain utility for us," she continued. "No other country, other than France, has voiced the view that it's not going to accept [privacy] protections that are guaranteed through codes of conduct, so I think the guidelines are definitely going to be useful to us. We're dealing with many other countries than France."

Multinationals Unhappy

Regardless of the outcome, officials of U.S. multinational corporations are clearly not pleased with the French objections, according to sentiments expressed at a recent transborder data flow conference here [CW, Dec. 10].

U.S. firms operating international computer and telecommunications networks had hoped the OECD document would provide a positive precedent for other world organizations, such as the Council of Europe (COE), the European Economic Community (EEC) and the United Nations, which are also working to develop data protection policies.

The OECD consists primarily of European nations but includes several other countries such as the U.S., Canada and Japan. OECD agreements are purely voluntary, whereas COE and EEC actions carry the force of law among their member nations.

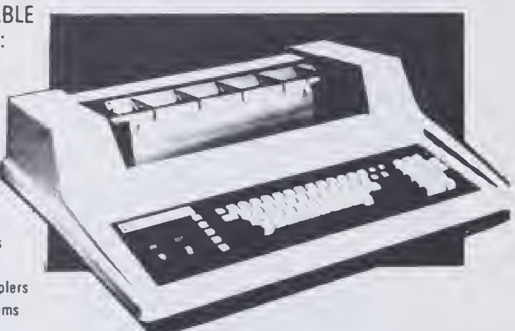
Surprise to U.S.

The French reservations to the OECD guidelines came as something of a surprise to U.S. delegates to the drafting group, which met in special session Nov. 19 to try to iron out the remaining objections to the document, according to Hummer, who is the U.S. representative to the group.

"We had made it perfectly clear from the very beginning that legislation was only one of the ways we attempt to go about [guaranteeing privacy]," she said. France knew "we were certainly going to rely on codes of conduct in some instances," — determine privacy guarantees by "the actual protection given the data by a country and not the means by which the data is protected, be it by law or code of conduct or what have you."

Hummer said the French delegation to the drafting group argued that the panel had "strayed from [its] mandate," arguing it should have been developing guidelines to harmonize national privacy laws and not rely on voluntary privacy protection.

With the support of Switzerland, France argued for returning the document for further drafting. However, it was overruled by the OECD Committee for Scientific and Technological Policy, the drafting group's parent body, which voted Nov. 21 to forward the draft guidelines to the Council of Ministers.



TEXAS INSTRUMENTS Model 820 KSR/RO
150 CPS Bi-Directional Printer

132 characters per line / Multiple copies
Compressed or Standard Print
In stock for immediate delivery

ALSO AVAILABLE FROM STOCK:
- T I Portables
- T I ASR & KSR
- Decwriters
- Diablo Printers
- Xerox
- Floppy Disks
- ADDS CRTS
- Hazeltine CRTS
- Video Projectors
- Video Adapters
- Modems & Couplers
- TWX-DDD Systems

Westwood Associates
DATA COMMUNICATIONS EQUIPMENT
25 Route 22 East / P.O. Box 10, Springfield, N.J. 07081
N.J. (201) 376-4242 (main office)
N.Y.C. Area (212) 662-0060 Connecticut Area (203) 932-6383
Baltimore Area (301) 358-7812 Philadelphia Area (609) 829-7280
Cleveland Area (216) 476-9336 Pittsburgh Area (412) 566-1525
Wilmington Area (302) 454-1113

PDP-11 PDP-11
RSX-11M

We can provide training at your facility for the following one week courses:

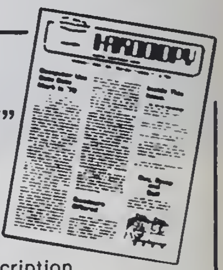
- PDP-11 Assembler (west coast only)
- RSX-11M V3 Fortran User
- RSX-11M V3 Macro-11 User
- RSX-11M V3 Systems (internals of RSX)

Call our 24 hour toll free number for detailed course outlines.

We have taught courses for the following major corporations:

RCA, Control Data Corporation, Tektronix, Dupont, Monsanto, General Electric, U.S. Navy.

Write or call:
Walter J. Gallant
Mini & Micro Educational Services
3700 East Stewart #195
Las Vegas, Nevada 89110
Toll Free (800) 327-9009 Ext 265
(from Florida (702) 452-8205 9-5, PST)



FREE COPY!
FOR DEC USERS "HARDCOPY"
The Newsletter for DEC and DEC Compatible Systems Users
LATEST NEWS!
BUY, SWAP & SELL COLUMNS!
Send business card and description of your DEC configuration for Free Subscription
DATALEASE 2770 EAST REGAL PARK DRIVE
ANAHEIM, CA 92806 714-632-6986

Dumb health insurance.

Now you can have extended warranty coverage on your Lear Siegler ADM-3A terminal for just $72 per year Start your Dumb Terminal® extended warranty today by calling Lear Siegler Data Products Division at (800) 854-3805 ext. 215. Smart and intelligent service contracts are also available at equally attractive rates.

Service Matches Employers With DP Job Applicants

ROCKVILLE, Md. — Need a job? Or have a job that needs to be filled?

Either need may be satisfied through a nationwide communications network offering proprietary information on 5,000 job candidates in the engineering, data processing and marketing fields.

Cybersource, a business service of Control Data Cybersearch, Inc., which is an employment service of Control Data Corp., stores a constantly revised and steadily growing data base of such openings and candidates in a CDC Cyber 176 computer at the firm's DP center here.

Users of the service can access the data base through CRTs located in their own offices, getting printouts of personnel information and resumes of professionals from around the country, according to Gerald Johnson, manager of information services for Cybersearch.

The network also functions as a conventional placement service, based on the same data bank.

At eight regional agency offices — in Chicago, Dallas, Houston, Minneapolis, Philadelphia, Los Angeles, Irvine and San Jose, Calif. — consultants meet with employers to help clarify their needs. A requisition is fed into the system, yielding a list of brief personal descriptions of candidates for the employer's consideraton.

Omitted from the list are the names and companies of the candidates, who may ask to be included in the network free of charge if they seek positions in the computer or electronics field.

"The computer is the starting point, a resource," Johnson explained. "From there our consultants take over. They preview the job prospect, help sell him on the company, arrange an interview and, if the client company is interested, complete the transaction."

Another more basic Cybersearch service is the Career Advancement Conference. Using the same data base, a number of employers with similar needs meet with candidates in an atmosphere "conducive to discussing employment possibilities," Johnson said. The hiring process is then handled entirely by the employer.

"Speed, convenience and timeliness are among the compelling features of the system," Johnson claimed.

Job Register Planned

KANSAS CITY, Mo. — An employment register designed to match computer scientists and data processors with prospective employers will be featured at the Eighth Association for Computing Machinery (ACM) Computer Science Conference here Feb. 12-14.

Staff of the Computer Science Employment Register will operate a message desk at the conference and maintain employer sign-up sheets to facilitate contacts.

Each applicant, either experienced or inexperienced, must complete a form stating his qualifications and specifications for a desired position. Employers will provide information about available positions.

Due by Jan. 18, applications will be one of three forms — applicant, academic employer or business, industry or government employer.

Four books of listings, which will be available at the conference for review, will be compiled from the forms. They will include student applicants; experienced applicants; academic employer; and business, industrial and government employer.

Applications for inclusion in the books may be obtained from and should be returned to Orrin E. Taulbee, ACM Computer Science Employment Register, Department of Computer Science, University of Pittsburgh, Pittsburgh, Pa. 15260. Applicants must specify which type of form they want.

Report Offers Auditing Hints For On-Line Sites

PENNSAUKEN, N.J. — Although data collection methods differ, auditors can use many of the same techniques for auditing on-line processing that they use for batch environments, according to a recent study.

Auerbach Publishers, Inc. has released a report, "Auditing in an On-Line Environment" that identifies the problems in auditing on-line systems that are not generally encountered in a batch environment.

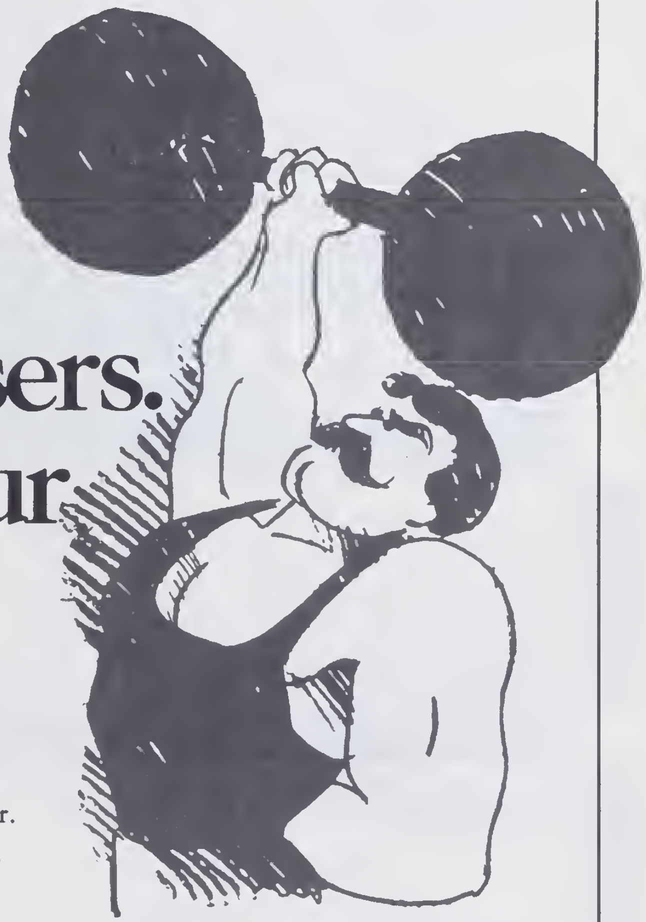
The report recommends that such tasks as recording and authorizing transactions, ensuring message integrity and implementing restart/recover, backup and security measures be approached in the same sequence as their on-line occurrence.

Typical examples of on-line applications and a cross-reference matrix of control areas are provided.

"Auditing in an On-Line Environment" was written by William E. Perry, executive director of accountants Computer User Technical Exchange. It is available for $10.

It can also be purchased as part of Auerbach's EDP Auditing reference service, which itself is part of the publisher's Information Management Series. It is available as a supplemental bimonthly service for $140/yr.

Auerbach is located at 6560 North Park Dr., Pennsauken, N.J. 08109.



VM/CMS users. Flesh out your APL.

If you're running, or plan to run, VM/370 with CMS, you owe it to your user community to run STSC's APL★PLUS® VM System on your computer. STSC, a world leader in APL time sharing services, has spent more than ten years building powerful, productivity-enhancing APL functions and features that fully meet the needs of the APL user. STSC's APL enhancements are built on your copy of IBM's VS APL to provide tremendous power and user productivity not available with APL from any other vendor.

Call Bob Cook at (301) 657-8220, or return the coupon. Your productivity will be given new life.

stsc
(formerly Scientific Time Sharing Corporation)

STSC, Inc.
7316 Wisconsin Avenue
Bethesda, Maryland 20014

☐ We're heavy APL users; call us soon!
☐ We run VS APL on VM/CMS; send more details
☐ We run (or plan to run) VM/CMS, but we're not using VS APL; keep us on your VM/370 enhancement mailing.
☐ If you release an MVS version of the VS APL★PLUS System, let me know!

CPU ________ Operating System ________

Name ________
Title ________
Company ________
Address ________
City ________ State ________ Zip ________
Phone ________

In 1,000-Page Testimony

'Fixed-Term Plan' Story Told in U.S. vs. IBM

By Connie Winkler
CW Staff

NEW YORK — "FTP" wasn't uttered once, but the Fixed-Term Plan story was presented at length here at the U.S. vs. IBM antitrust trial in the testimony of Jonathan G. Powers.

Powers is now vice-president of finance and planning for IBM's Office Products Division, but during the peripherals action he was chief financial analyst for the Data Processing Product Group (DPPG).

Instead of Powers' taking the stand, about 1,000 pages of his testimony in IBM's private antitrust suits was spread recently on the record in this case.

Powers' testimony covered IBM's introduction of the 2319A and 2319B disks in late 1970, but primarily concentrated on IBM's discount of peripheral equipment in May 1971 — FTP.

Under FTP, IBM offered I/O equipment at 8% off for a one-year lease and at a 16% discount for two years. IBM also discontinued additional use fees that required users to pay extra if they used leased equipment more than 176 hours a month.

The peripherals case has also been covered by earlier Justice Department witnesses.

"More Competitive"

"Because you are offering FTP, your products are more competitive. You are going to sell more, more people are willing to buy your products, people will keep your products longer and therefore you get longer installaions," Powers explained in the Transamerica Computer Co. vs. IBM case early in 1979.

Because of FTP, IBM predicted it would lose $13 million in revenue in 1971 and $20 million in 1972, but by 1975 would have earned $411 million more in revenue than it would have if there had been no FTP, Powers said on direct.

The plaintiff later countered with IBM documents predicting a $671 million loss through 1976 as a result of FTP.

Aggressive Response

Powers acknowledged IBM responded aggressively with FTP to the plug-compatible manufacturers (PCM), particularly Memorex Corp. and Telex Corp., which were offering copies of IBM peripherals. It was necessary, Powers said, because the PCMs were pricing aggressively and installing as many as 1,000 systems a month.

PCMs strongly contend FTP was intended to drive them out of business.

The plaintiffs' lawyers introduced several IBM internal studies which demonstrated that up until May 6, 1971, when the top Management Review Committee (MRC) ordered a review of long-term leases, every long-term lease proposed had been rejected as not financially feasible.

As late as April 27, 1971, DPPG rejected a long-term lease on the 360/20 and System/3 because they were not financially viable.

Change in Thinking

Powers countered that none of these other long-term lease proposals were for the same products or for the same terms as FTP. Why the change in thinking?

"The competition was stronger than I had thought earlier, and during this period, . . . the spring of 1971, as I saw more about how much equipment was being installed, how well it was working, how well customers liked the equipment, my perception of how successful the PCMs would be was changed," Powers recalled.

Customers wanted long-term leases at this time, Powers noted several times.

Other IBM defense points Powers made were as follows:

- The 2319A disk announced in September 1970 at a lower than usual $1,000/mo rent wasn't merely a reengineered 2314 (which was heavily marketed by the PCMs).

Powers, who presented the 2319A financial analysis to the MRC, said the 2319A was sound because of the positive impact it would have: "The disk file makes a better system so [IBM] will sell more systems. As a result of announcing the disk we sell more of other products."

- The 2319B and 3420 tape drive were profitable for similar reasons.

- Powers flatly rejected the notion that the price for the new System/370 Model 145 announced in this period or its associated memory was adjusted to offset or reflect the price cuts for the 2319A.

MRC did approve a different price for the 145 than what was first presented, but the $300 plus price was the finance group's recommendation anyway, he said.

- IBM's accross-the-board price increases in 1971 occurred because of inflationary cost increases — there had been no price increases since 1967. And, the increases were delayed several months because of President Nixon's price freeze, Powers said.

- Powers pointed out that IBM's position was slipping at that time — measured internally in points of $1/mo of lease revenue.

Net install points for all DP products slipped from 50 million points in 1969, to 25 million to 30 million in 1970, to 16 million to 17 million install points in 1971, picking up finally to 30 million points in 1972.

- IBM's total revenues in 1970 were below those of 1968, Powers said.

'Illegal' Overreaction

Plaintiffs on cross-examination suggested IBM overreacted illegally, particularly with FTP, to the competition posed by PCMs.

Forecasts used to support the FTP financial analysis predicted IBM would lose 88% of its 3330 disk placements and 75% of its new 3420 tape placements to the PCMs by year-end 1975.

Wasn't that unrealistic? Wouldn't the MRC be "unduly suspicious?" the plaintiffs asked.

"At that time the fact was that half a dozen PCMs had announced Merlins [3330 disk] and were going to start shipping them very shortly. Certainly it was my belief that, based on what we understood about the prices, they were going to be very successful," Powers testified.

Before FTP, PCMs had competed successfully by pricing about 20% less than IBM.

A May 1971 study presented to MRC by Data Processing Division President Ralph Pfeiffer predicted by year-end 1975, PCMs would have only 25% of the 3330 (2314 follow-up) lease market.

The plaintiff also observed that the FTP discount plus the additional use discontinuance amounted to a greater percentage discount than the PCMs offered — usually the 12th month free.

Cash Flow Studies

IBM did cash flow financial studies on both Memorex and Telex, and plaintiffs suggested IBM then used this information against them. Memorex needed volume to sustain its heavy organizational structure, one IBM internal memo said, and Telex was dependent on a long product life to recover its investment.

Plaintiffs rejected one IBM forecast that proposed Memorex would not react to the 2319 announcement and price cut. If Memorex needed volume, how could they have succeeded in placing new products if the Memorex price was the same as IBM's? the plaintiff asked.

Other IBM alternatives had Memorex responding with a 12% to 20% discount, which is close to what IBM ended up offering on FTP.

The plaintiff also argued that the 2319 ended up with a shorter than average product life.

The private litigants argued that a more dense 3330 model, Iceberg, and the 3340 Winchester disk should have been included in 2319 and FTP forecasts.

CONVERT YOUR DEC® VT-100 TERMINAL
TO A FULL PDP 11/03 IN ONE EVENING
With the BT-100 CONVERSION KIT

Upgrade kit includes Front Panel Controls, Crystal Clock, DEC® Quad-By-Four Backplane, Fan, Cable Harness, Mounting Hardware, and full documentation.
PRICE $595
Full Conversion Kits also available.

RAINBOW COMPUTING, INC.
9719 Reseda Blvd. • Northridge, Ca. 91324
Telephone (213) 349-5560

THE INSTITUTE FOR CERTIFICATION OF
COMPUTER PROFESSIONALS ANNOUNCES THE
CDP® ANNUAL EXAMINATION
SCHEDULED FOR MAY 3, 1980

The annual examination for the Certificate in Data Processing (CDP) will be held on May 3, 1980, at selected test centers throughout the world.

Specific requirements for this year's examination are detailed in the "Certificate in Data Processing Examination Announcement and Study Guide." The study guide and application form for the 1980 examination are available on request from ICCP

Deadline for Filing Application is March 1, 1980

Please forward the "Certificate in Data Processing Examination Announcement and Study Guide" along with application and test site list.

Name

Street Address

City State or Province Zip Code

MAIL COUPON TO: Institute for Certification of Computer Professionals Certification and Testing Section
304 East 45th Street
New York, N. Y. 10017

NOW . . .
All the benefits of Carpeting . . . . . with better STATIC PROTECTION than tile.

COMPU-CARPET™
High Performance Anti-Static Carpeting

COMPU-CARPET permanently anti-static carpets and COMPU-MATS™ • Eliminate static problems in computer and terminal areas • Protect sensitive electronic equipment • Meet IBM recommendations • Provide comfort and acoustical advantages of high quality carpeting • Carry a 5-Year wear and static warranty.

U.S. Pat. No. 4,153,749.

UTP UNITED TECHNICAL PRODUCTS, INC.
THE STATIC CONTROL PEOPLE

Dept. CW
32 Southwest Industrial Park
Westwood, MA 02090
(617) 326-7611

A Seminar on Interactive Computing and the DTSS Associates Plan

Enter the Interactive Decade at our Seminar on Interactive Computing, to be held in Miami Beach, March 20th and 21st. (That's the same week as Interface '80, so just plan a couple of extra days in town, and make your trip all the more worthwhile.)

In the 1980's, new interactive computing tools will extend the capabilities of decision-makers and fuel the growth of organizations, large and small. And there's a real need for useful information about these new possibilities. Now DTSS Incorporated, a subsidiary of Metropolitan Life Insurance Company, will tell you about interactive computing opportunities in a comprehensive 1½ day seminar, presented by experts in the field.

WHO SHOULD ATTEND?

In-house data processing managers who want to stem the flow of interactive dollars outside their company... Managers of service bureaus who want to offer interactive features to their customers... Management consultants who want to include interactive computing techniques in their repertoire of skills and capabilities... ...*Just about anybody* who wants to take advantage of the incredible opportunities offered by interactive computing systems.

So—if you have been looking for a better way to use interactive computing services, you'll want to attend this event!

WHAT WILL YOU LEARN?

You'll learn about interactive computing and its value to the modern organization, as well as the current status of the market for interactive services.

You'll learn, from hands-on experience, how an interactive system works, and what it's like to use a computer in a fast, easy problem-solving mode.

You'll learn how you can manage, market, and utilize interactive computing services at a low investment and a low cost with the added benefit of a lucrative software exchange program—through the recently announced *DTSS Associates Plan,* which has been created explicitly to make interactive computing available to a wider community of users.

In short, you'll learn all you need to know about the expanding new world of interactive computing services, and how you can enter that field. Now.

WHO WILL PRESENT THE SEMINAR?

The seminar will be presented by experts in the field of interactive computing. They will be led by Daniel Walkovitz, President of Corporate Management Systems, Inc., a leading developer of Decision Support Systems for business.

You will also have the opportunity to experience interactive computing directly, and meet on a one-to-one basis with members of the DTSS staff, who will discuss interactive computing and the DTSS approach in detail with you.

WHERE WILL THE SEMINAR BE HELD?

The seminar will be held at the Holiday Inn Hotel in Miami Beach on March 20th and 21st. The day's schedule will be completed at noon on the 21st, giving you plenty of time to return home. So if you are planning to be in Miami anyway, why not attend an event that could make the 1980's your best decade ever?

The cost of the seminar is only $125.00. Worth it? You bet.

Just fill out the attached coupon and return it to Paul F. Henneberry, Associates Plan Manager. And don't delay. Space is limited.

DTSS

The Immediate Alternative. A subsidiary of Metropolitan Life Insurance Company. 10 Allen Street. Hanover, NH 03755. 603/643-6600.

REGISTRATION FORM: SEMINAR ON INTERACTIVE COMPUTING AND THE DTSS ASSOCIATES PLAN

March 20th and 21st, 1980
Holiday Inn, Miami Beach

Please send completed form with a check for $125 to:

Paul F. Henneberry,
Associates Plan Manager
DTSS Incorporated
10 Allen Street
Hanover, NH 03755

Call 603/643-6600 for further information

NAME

TITLE

COMPANY

ADDRESS

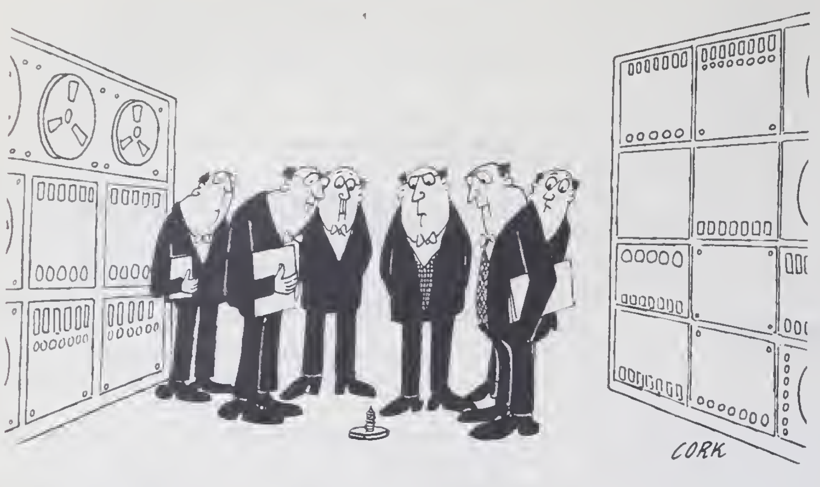
CITY

STATE AND ZIP

TELEPHONE

CW1148

Overcoming the Barriers to High-Performance Low-Cost Interactive Computing. NOW



On-Line System Helps Plot California Quake History

By Jeffry Beeler

CW West Coast Bureau

PASADENA, Calif. — An on-line plotting system reportedly saved seismologists months of labor during a recent study aimed at reconstructing southern California's earthquake history since 1952.

Aided by computing equipment at the California Institute of Technology here, the study revealed that southern California's seismic activity began declining markedly following a 7.7-level quake that struck Kern County (surrounding Bakersfield) in 1952. The drop in underground activity continued steadily until 1968, when seismic unrest in the region again began mounting, according to Dr. Kate Hutton, an associate seismologist with Caltech's Seismological Laboratory.

Hutton and her two colleagues — Jean-Bernard Minster, Caltech seismology professor, and Carl Johnson, a U.S. Geological Survey geophysicist — derived their findings from a seismological data base maintained by the laboratory's 1M-byte Prime Computer, Inc. Model 500. The data base lists the date, location and magnitude of the more than 40,000 southern California earthquakes recorded by Caltech and the Geological Survey since 1932.

After translating the contents of its data base into graphics form, the laboratory's CPU depicted each of the 40,000-plus quakes as a separate feature on a series of contour maps.

Study of Frequency

In all, the system drew five maps, one for each of the four 10-year intervals between 1932 and 1972 and another for the last seven years. By counting the number of seismic events in each map and comparing the five totals, researchers hoped to discover whether — and by how much — the frequency of earthquakes in southern California has varied during the previous 27 years.

Caltech seismologists had attempted a similar study back in 1963. In the absence of any DP assistance, however, the earthquake-tracking effort produced only one contour map, which took a graduate student months to draw.

In the latest study, Hutton and her colleagues noted a 40% drop in underground activity following the 1952 Kern County quake, the largest temblor to hit southern California since seismic recording began.

"We expected the amount of seismic activity to decrease significantly in the wake of the 1952 quake due to the easing of strain on surrounding rocks," Hutton said. "What surprised us was that the dropoff affected such a large area."

At present, the exact significance of the trio's finding remains unclear, she said.

The 1952 upheaval was also accompanied by a regional shift in quake distribution, Hutton and her colleagues found. Before 1952, the highest concentration of southern California tremors occurred south of a chain of mountains running in an east-west line across the San Andreas fault.

After the Kern County quake, the regional center of seismic activity moved north of the mountain range, Hutton said.

Calendar

Feb. 13-14, Palo Alto, Calif. — **IBM Evolving Network Strategy.** Contact: The Yankee Group, P.O. Box 43, Harvard Sq., Cambridge, Mass. 02138.

Feb. 13-15, New York — **Systems Analysis and Design.** Contact: Datapro Research Corp., 1805 Underwood Ave., Delran, N.J. 08075.

Feb. 13-15, Scottsdale, Ariz. — **DP Performance Management.** Contact: Applied Computer Research, P.O. Box 9280, Phoenix, Ariz. 85068.

Feb. 13-16, Walker's Cay, Bahamas — **NCR Service Bureau Users Group.** Contact: Bill Aumen, P.O. Drawer V, Fort Myers, Fla. 33902.

Feb. 14-15, Orlando, Fla. — **Computer Negotiations Workshop.** Contact: International Computer Negotiations, Inc., 1331 Palmetto Ave.. Winter Park, Fla. 32789.

Feb. 18-21, San Diego — **Microdata Users Winter Conference.** Contact: Micru International, 4300-L Lincoln Ave., Rolling Meadows, Ill. 60008.

Feb. 19-22, Atlanta — **Eighth Annual World Fair for Technology Exchange.** Contract: Dr. Dvorkovitz & Associates, P.O. Box 1748, Ormond Beach, Fla. 32074.

Feb. 20-22, Chicago — **Practical Approaches for Improving Systems and Organizational Productivity.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Feb. 20-22, Miami — **Data Processing Operations Management.** Contact: Center for Continuing Education, University of Chicago, MC Seminar Division, 1307 E. 60 St., Chicago, Ill. 60637.

Feb. 20-22, Chicago — **Word/Text Processing.** Contact: American Institute of Industrial Engineers, P.O. Box 3727, Santa Monica, Calif. 90403.

The SUPERMARKET of COMPUTER PRODUCTS
PRESENTS
Disk Sub Systems Ala Carte

DEC, DATA GENERAL and Others
For LSI11*, PDP11*, PDP11/70*, VAX*, UNIBUS*, & MASSBUS*.
*Tradenames of Digital Equip. Corp.

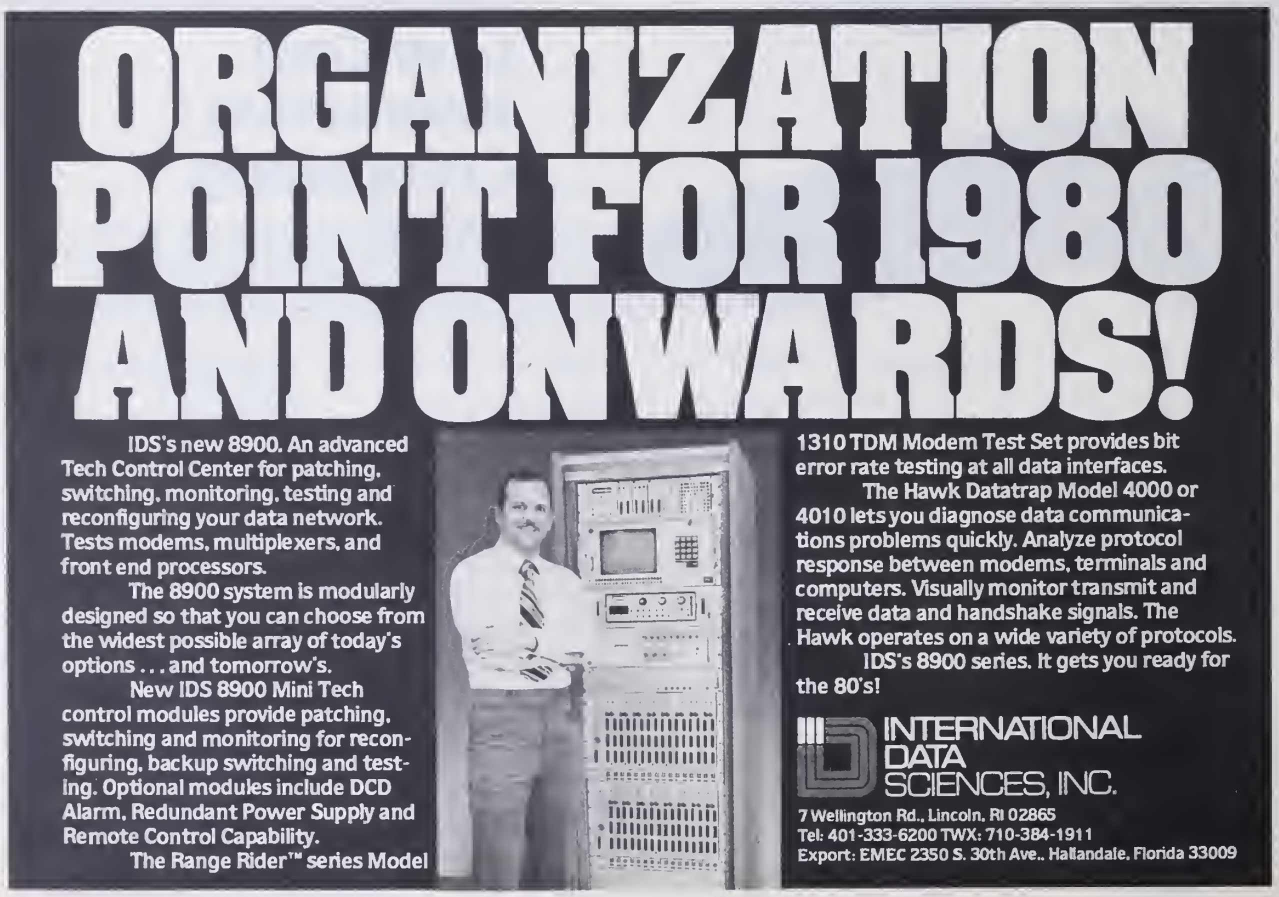
Featuring:
CONTROL DATA'S SMD's, CMD's & MMD's, and CENTURY DATA'S TRIDENTS, HUNTERS, and MARKSMAN.

Plus a Menu of CONTROLLERS:
● SYSTEM INDUSTRIES ● EMULEX ● WESTERN PERIPHERALS
● BYTRONIX ● MINI COMPUTER TECHNOLOGY ● RIANDA

Other G.F. Products
◆ PRINTERS & SUBSYSTEMS ◆ TAPE DRIVES & SUBSYSTEMS
◆ COMPUTERS, MEMORIES & CONTROLLERS ◆ CRT'S, TERMINALS & MEDIA
◆ TURNKEY BUSINESS SYSTEMS ◆ SOFTWARE (Operating & Application)

—We Offer Installation and Service—

GF
GEORGE FÖLDVARY & ASSOCIATES, INC.
9229 Sunset Blvd., Suite 811, Los Angeles, CA 90069
(213) 274-0208 • TWX 910-490-2511
GEORGE FÖLDVARY & ASSOCIATES, EAST INC.
401 E. Shore Road, Lindenhurst, N.Y 11757
(516) 884-1207


ORGANIZATION POINT FOR 1980 AND ONWARDS!

IDS's new 8900. An advanced Tech Control Center for patching, switching, monitoring, testing and reconfiguring your data network. Tests modems, multiplexers, and front end processors.

The 8900 system is modularly designed so that you can choose from the widest possible array of today's options . . . and tomorrow's.

New IDS 8900 Mini Tech control modules provide patching, switching and monitoring for reconfiguring, backup switching and testing. Optional modules include DCD Alarm, Redundant Power Supply and Remote Control Capability.

The Range Rider™ series Model 1310 TDM Modem Test Set provides bit error rate testing at all data interfaces.

The Hawk Datatrap Model 4000 or 4010 lets you diagnose data communications problems quickly. Analyze protocol response between modems, terminals and computers. Visually monitor transmit and receive data and handshake signals. The Hawk operates on a wide variety of protocols.

IDS's 8900 series. It gets you ready for the 80's!

INTERNATIONAL DATA SCIENCES, INC.
7 Wellington Rd., Lincoln, RI 02865
Tel: 401-333-6200 TWX: 710-384-1911
Export: EMEC 2350 S. 30th Ave., Hallandale, Florida 33009

DP School Daily Encounters Students 'With Ax to Grind'

By Jay Woodruff
CW Staff

E. HARTFORD, Conn. — "People who come here have an ax to grind. They try to burn up an instructor if he isn't ready for it."

That's how Robert Laughlin, vice-president of a school for entry-level DP workers, described the kind of students his instructors see each day.

The Computer Processing Institute (CPI) is a 15-year-old school originally founded to produce programmers and operators for a DP service bureau. It now enrolls close to 1,400 students who come from an area surrounding its two Connecticut facilities. Graduates typically begin work in that same area in programming, computer operations and data entry, according to Laughlin.

This proprietary school seems to attract persons who are looking for a new career, not students who have just graduated form high school, he indicated.

They tend to expect a lot from for the $1,600 to $3,250 they will pay for a three-month to six-month course, he said.

CPI says its objectives to produce people with six months to one year of experience, but to accomplish that in three to six months. The institute runs classes, here and in its Stratford, Conn. branch five days a week for the length of the course.

Twenty-five full-time instructors teach classes of about 30 students. Night courses of study are also available, but take twice as long to complete as the daily program.

Students use any one of the three IBM 360 systems (models 30, 40 and 50) as well as a Data General Corp. Nova minicomputer. An IBM 4300 series system is on order.

High Placement Rate

To keep up a quoted 90%-plus placement rate, CPI offers courses designed to reflect the job requirements of area businesses and organizations, according to CPI President Dave Shefrin.

"We work hard at developing job orders. We change our curriculum only when industry tells us things need to be changed to reflect their needs," he explained.

The school's greatest priority is to eschew academics in favor of hands-on experience that will directly relate to businesses' requirements in the two areas it serves. Each facility offers a different brand of training.

"In Hartford, we train and place students in OS/Cobol environments because the area has a heavy concentration of banks, insurance companies and major manufacturers, Shefrin said.

"But in Bridgeport, the curriculum does not emphasize OS as much because employers there are small to medium manufacturers. The coursework is tailored to the smaller companies' needs."

Between the two facilities, programming has been the most popular program, attracting 60% of the students in the six-month course, followed by operations and data entry in that order. Laughlin remarked that the school's equal enrollment of males and females reinforces his feeling that DP (at this level) offers good opportunity for both sexes.

What do those who have graduated think of the school?

Vincent Zeller, who graduated in late September, has worked almost a month at Middlesex Memorial Hospital in Middletown, Conn. Zeller said the one thing that sticks in his mind is the willingness of one instructor to stay at school extra time when Zeller needed the help.

A former credit manager at a finance company, Zeller approached CPI with no particular career goal but with the recollection that he enjoyed working at a terminal in the other job.

"It seemed to point me toward this kind of work," Zeller said. After discussing this idea with a counselor, he enrolled in a six-month programming course and developed a working knowledge of Cobol, Assembler and RPG.

The preparation was comparable to on-the-job training, Zeller said, and "basic concepts are the same as those in use throughout the industry.

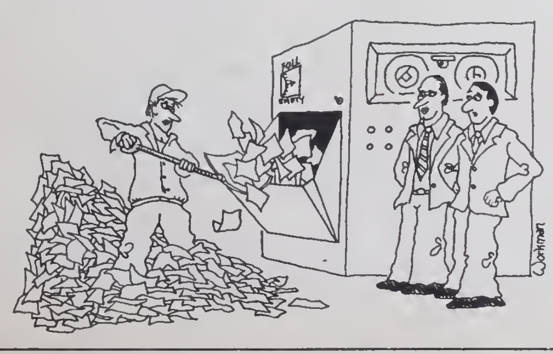
Darlene Zahid, now working at Electronic Data Systems Corp.'s (EDS) Avon, Conn., facility, went to CPI because she didn't like the hours required in her work as a nurse.

She took a business computer programming course of study and is now training at EDS as a systems engineer. Zahid described her time at CPI as a "more intense type of study" than she had experienced at college.

"For an entry-level job, the information I learned [at CPI] was adequate enough to make me an important part of the facility. Our company has training in Dallas, but my own training made it [largely unnecessary] for me to go there,"Zahid said.

She characterizes the faculty as "pretty cooperative, willing to give an answer or get one for you."

Eight full-time placement people at CPI were available to Zahid, and she indicated that she was satisfied with the aid she got. After considering four job offers, she decided on EDS.



'It's Certainly Going To Give Data Processing a New Dimension.'

IBM 3270 USERS

ISI makes your 3270 system do things that IBM doesn't

ISI takes over where IBM leaves off. For example:

Want high speed printout up to 300 lines per minute. . .**now?** Want to print labels or tags with large, readable characters? Want executive quality printout for word processing applications? ISI offers this and more!

Interface Systems, Inc. specializes in making IBM 3270 systems more versatile with a broad series of printers not available from IBM. They are plug-for-plug compatible with IBM 328X printers and ready to run on your system. And they are available within 30-60 days upon receipt of order.

Like more information? Call or write today. We will give your inquiry prompt attention.

interface systems, inc.
462 Jackson Plaza Ann Arbor, MI 48103 (313) 769-5900

Representative
Inquiries Invited

New Releases Available

MCBA™ is proud to announce the *completion* of new releases of its Business Application Packages in:

- **Data General CS COBOL**
  The packages listed below are now available in CS (Commercial System) COBOL for use on DG's CS/30, CS/40 and CS/60s.
- **Data General Multi-User Extended BASIC**
  These same packages are now available for use on selected Data General microNOVA™s, NOVA®s, and Eclipses®

- Accounts Receivable (with Sales Analysis)
- Order Entry/Invoicing (with Inventory Control)
- Accounts Payable
- Payroll
- General Ledger

Both versions of these packages are fully interactive and interfaced systems, allowing use in single or multi-terminal hard-disk environments.

MCBA offers flexible licensing of these packages including source code, complete documentation and one year's support. To obtain more information, contact the Sales Department at:

MCBA
Mini-Computer Business Applications, Inc.
117 South Brand Boulevard
Glendale, California 91204
Telephone: (213) 247-9050 Telex: 194188

MicroNOVA™ is a trademark, and NOVA® and Eclipse® are the registered trademarks of Data General Corp
MCBA™ is a trademark of Mini-Computer Business Applications, Inc

Not One Program Rewritten

User Goes From 360 to 4331 Hassle-Free

By Jay Woodruff
CW Staff

ALLENTOWN, Pa. — An IBM 360 user with an extended DOS operating system and a variety of proprietary software packages jumped to an IBM 4331 and four 3310 disk drives without re-writing a single program.

Allentown and Sacred Heart (ASH) computer center got a 1M-byte 4331 in October, nine months ahead of schedule and with twice the 512K bytes of memory IBM originally said it could deliver.

Although the center — which provides DP services to four area hospitals — leased the machine to increase its processing throughput, it also wanted to retain mainframe compatibility with the 2,900 programs run on its IBM 360/50 and 360/65 [CW, Feb. 14, 1977, April 16, 1979].

Further, though ASH eventually plans to convert the programs to take advantage of the 4331's full capabilities, it wanted to avoid spending the months on conversion that an incompatible machine would require, according to information systems manager Roger Winner.

ASH, with a staff of 50, currently runs the older CPUs as a backup to the 4331 and will continue to do so until they are succeeded by another 4331, due for installation in July.

Variety of Vendors

The 4331's big advantage is that it protects ASH's programs until they are converted to the 4331's native mode, Winner said.

Starting with DOS Release 26, ASH uses Universal Software's Asap and Relo packages to create what Winner called a "highly extended" DOS environment — this by virtue of the fact that they "literally go into the supervisor."

Other proprietary software that ran on the 4331 without incident includes Applied Date Research, Inc.'s The Librarian, Cincom Systems, Inc.'s Total data base management system and Environ 1 and Westinghouse Electric Corp's disk utility.

Scobol, a Cobol structured programming aid from Software Consulting Services in Allentown, and Pansophic Systems, Inc. Easytrieve also presented no problems to the 4331, Winner said.

"IBM really didn't know whether these products would work, but we decided to risk it and proceed. We were fairly confident that we would be able to use them," the manager recalled.

The center would have been happy if the 4331 emulated the 360 without sacrificing processing speed. However, the 3310 disk systems, which Winner said are rated four times faster than the IBM compatible 2314 systems, may actually reduce job execution time.

Morevoer, ASH was able to equalize its 4331 lease costs by cancelling maintenance agreements on the 360/50 and Memorex Corp. disk drives. This was done because the older CPU and disk systems have little market value.

Ash will make a decision whether to fix or scrap the older equipment as breakdowns occur.

Installation was a painless affair, Winner said. The 4331 was ready for diagnostic tests two hours after it was unloaded from the delivery truck.

Peripherals were connected within a day. They included the Memorex 2314-compatible disk drives, a Memorex 1270 telecommunications controller, Decision Data Computer Corp. Model 6615 high-speed printers and IBM peripherals such as tape drive systems.

All peripheral gear worked as well on the 4331 as it had on the 360 machines, Winner reported.

ASH tested the 360/50, with its 2314-compatible disk systems, against the 4331 and the 3310 disk drives by running a variety of programs over the two systems. The new system, while emulating the 360 CPU, ran programs between 15% slower and 50% faster than the older machine, depending on job type and mix.

This was largely because of the higher performance of the 3310s, Winner said, but it is a moot point because ASH will continue to use the older disk systems for now.

"The summary line is that we've been able to go to the 4331 without having to convert a program. We can migrate to it at our own speed to take full advantage of its capabilities," he pointed out.

"For once, we've gotten something that was as advertised. We see it as a viable alternative for 360 users. At least from our limited perspective, the 4331 has a high degree of compatibility with the 360.

"We expected a large conversion effort and have been very pleasantly surprised that we didn't have to stop and convert," he remarked.

To date, ASH has experienced only one problem with the 4331. Just about every other day, the system console is locked out by an error condition that requires the organization to perform an initial microprogram load. But IBM service personnel have been working on the problem, Winner said.

Donald B. Medley Named Program Chairman of NCC

ANAHEIM, Calif. — Dr. Donald B. Medley, DP consultant and educator, has been appointed program chairman for the 1980 National Computer Conference, to be held here May 19-22.

A DP educator and professional for over 25 years, Medley has developed many DP programs for educational institutions and industry, including an administrative DP model that led to a change in the California education code.

He is currently an instructor in DP and coordinator of the Cooperative Work Experience at Moorpark College in Moorpark, Calif., a member of the board of directors at Applied Systems Resources, Inc. and president of Evaluation Techniques Consortium, Inc.

"Usability of the computer will be an underlying theme in every aspect of the NCC '80 conference program," Medley said. "The program will be designed to produce tangible results and to give the attendee practical, useful ideas of how the computer can be used to gain improved performance in a wide variety of environments."

Major topics to be covered at NCC will include applications, artificial intelligence, communications, computer architecture and data base management. Also treated will be earth resources, education, image processing, minicomputers and microcomputers and office automation.

In addition, such subjects as security and privacy, simulation, social implications, software engineering and student involvement will also be featured.

Among Medley's scholastic credits are research conducted on the privacy of student records and an accreditation of community college DP programs.

PRYOR offers new premium grade computer ribbon...at least 20% LONGER LIFE!

We already stock every data processing ribbon you could need. Now, we're proud to introduce new SIGMA 20 to our line. SIGMA 20 is Premium Grade. It's the answer to your wide computer ribbon problems. Tests indicate as much as 50% longer life over standard ribbons, but because of varying applications and printer characteristics, we only promise 20% longer life. That's new SIGMA 20...sharp impressions over a longer life at a lower cost than you'd think. Free replacement or credit if SIGMA 20 doesn't deliver as promised. Call us.

PRYOR CORPORATION
FULL LINE COMPUTER SUPPLIES FOUNDED 1959
400 N. Michigan Ave.
Chicago, Illinois 60611
Phone: 312/644-5650

Announcing a unique opportunity for data communications marketers to introduce themselves and their products to key officials in The People's Republic of China

The People's Republic of China has asked *Computerworld* to sponsor a two-week China Trade Mission, March 13-29, 1980. The topic for the seminar is "Planning and Developing Data Communications Data Base Systems."

Computerworld and the Chinese sponsoring organization, The Chinese Institute of Electronics, are accepting applications from U.S. companies who wish to participate. Representatives of a limited number of American firms will have the opportunity to present technical papers to key decision-making officials in China.

This trip also will give you the opportunity to familiarize yourself with the Chinese computer market and to join other U.S. firms competing in this active, multi-billion dollar marketplace. You will have an opportunity to discover methods of doing business in the People's Republic and to enjoy the unique culture of this "sleeping giant."

Time is short, however, and if you wish to be considered for this trade mission, you must act right now. For further information, please call or write:

D. La Muraglia
Manager, International Marketing Services
CW Communications/Inc.
375 Cochituate Road
Framingham, MA 01701
(617) 879-0700

COMPUTERWORLD

. . . the one weekly newspaper that's designed to fulfill your unique "need to know". . . the one newspaper that can give you all the current information you need to benefit you, your organization and your career progress . . . 52 weeks of incisive news, commentary and special reports . . . subscribe today, use the attached postage paid order form.

☐ ***Please enter my subscription***
(details on back)

☐ ***I'm already a subscriber, but I'd like you to change my:***
- ☐ ***address***
- ☐ ***title***
- ☐ ***industry***
- ☐ ***other***

My current mailing label is attached and I've filled in new information on the other side

Put old label or label information here

Please send me COMPUTERWORLD for one year. RATES: United States—$30 Canada, Central & South America—$50 Europe and Near East—$90 Other Foreign—$150 (Airmail Service)

☐ Check Enclosed
☐ Am Ex ☐ BA/Visa ☐ MC

(MC Only · List four digits above your name)

If charge we must have cardholder's signature: ______________________ Expiration Date: ____________

First Initial		**Middle Initial**		**Surname**	
Your Title					
Company Name					
Mail To:					
City		**State**		**Zip Code**	

Address shown is:
☐ Business
☐ Home

☐ Check here if you do not wish to receive promotional mail from *Computerworld*.

☐ Check here if you're interested in receiving information on *Computerworld*'s Index.

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

CIRCULATION DEPT. 375 Cochituate Road, Rte. 30, Framingham, MA 01701

PLEASE CIRCLE 1 NUMBER IN EACH CATEGORY

BUSINESS/INDUSTRY

- **10** Manufacturer of Computer or DP Hardware/Peripherals
- **20** Manufacturer (other)
- **30** DP Service Bureau/Software/Planning/Consulting
- **40** Public Utility/Communication Systems/Transportation
- **50** Wholesale/Retail Trade
- **60** Finance/Insurance/Real Estate
- **70** Mining/Construction/Petroleum/Refining
- **75** Business Service (except DP)
- **80** Education/Medicine/Law
- **85** Government - Federal/State/Local
- **90** Printing/Publishing/Other Communication Service
- **95** Other: ____________

TITLE/OCCUPATION/FUNCTION

- **11** President/Owner/Partner/General Manager
- **12** VP/Assistant VP
- **13** Treasurer/Controller/Finance Officer
- **21** Director/Manager of Operation/Planning/Administrative Service
- **22** Director/Manager/Supervisor DP
- **23** Systems Manager/Systems Analyst
- **31** Manager/Supervisor Programming
- **32** Programmer/Methods Analyst
- **41** Application Engineer
- **42** Other Engineering
- **51** Mfg Sales Representative
- **52** Other Sales/Marketing
- **60** Consultant
- **70** Lawyer/Accountant
- **80** Librarian/Educator/Student
- **90** Other: ____________

Talent Bank Locates Women To Serve State Government

BATON ROUGE, La. — The Louisiana Talent Bank of Women, which identifies qualified women to serve on state boards and commissions and to fill appointed policymaking positions in the state government, is assisted in its search by an IBM 370/158.

More than 500 applicants are currently listed in the data bank, and the Talent Bank's goal is to increase that number to 1,200, according to Martha Madden, Talent Bank director.

The Talent Bank encourages women with varying backgrounds to submit applications and resumes. Resumes are stored at the Louisiana Bureau for Women while information such as name, address, Social Security number, education, experience and fields of interest is stored on the IBM 370/158.

Automated Search

When the Talent Bank learns of a vacancy, an automated search is performed to match the vacancy with women who have experience and/or interest in that area. The most qualified women are recommended for the job by the Talent Bank and are considered by the state along with other applicants.

The success rate of placing women is quite high: Six Louisiana women have been placed in state government positions in recent months, Madden noted.

Established in 1977 by executive order of the governor in a statewide effort to locate qualified women for state positions, the Talent Bank notifies women of important openings and also brings women to the attention of the state.

Although 53% of the state's voting population is female, the number of women holding responsible state government positions is currently far below that, according to the Talent Bank.

Additional information is available from the Talent Bank at 530 Lakeland Drive, Baton Rouge, La. 70802.

Gambling Operation Uncovered In Coded MPU Files

By a CW Staff Writer

TULSA, Okla. — Computer experts brought in by the police department discovered coded files from a gambling operation in a computer confiscated in a raid here recently.

The Apple Computer, Inc. Apple II microcomputer was found to have the names, addresses and phone numbers of 192 Tulsa residents — customers of a gambling operation offering bets on professional and collegiate football games.

But, as Lt. Drew Diamond of the Tulsa Police Department's Organized Crime Division put it, "if you didn't know the information was there, you wouldn't have found it."

When the police removed the system from the home of Tulsa resident Paul Donnely Rucker, 68, they didn't have much to go on because there were no records found other than those they suspected to be in the MPU.

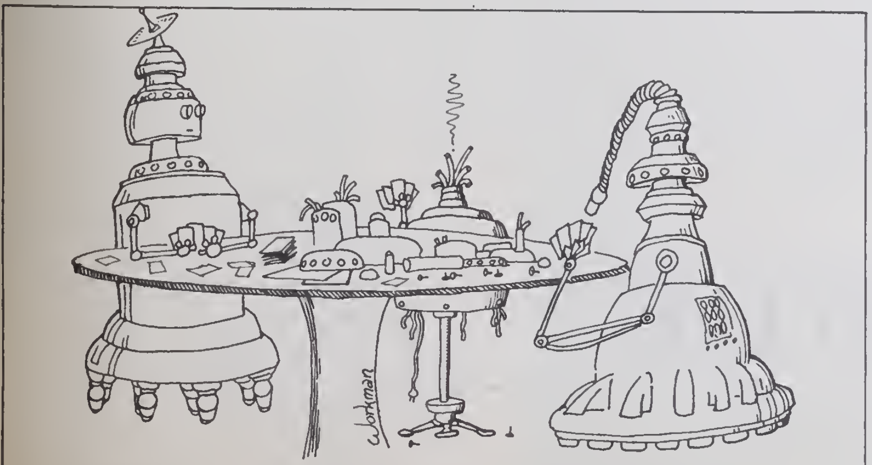
Officials were worried about getting access to the files without triggering what they guessed was a command to erase the records if the data was called up in anything but a prearranged sequence.

Nine hours after they started, the experts were able to access the files without erasing them, Diamond said. Although the records are expected to reveal a million-dollar gambling operation, Diamond was not able to disclose how much money was involved because the case is pending in a district court. He admitted, however, that it was an "expensive" operation.

Defense lawyers have already caused the hearings on this case to be postponed twice, and another hearing is scheduled for this week. Jurisdiction has been moved from city courts to the state court.

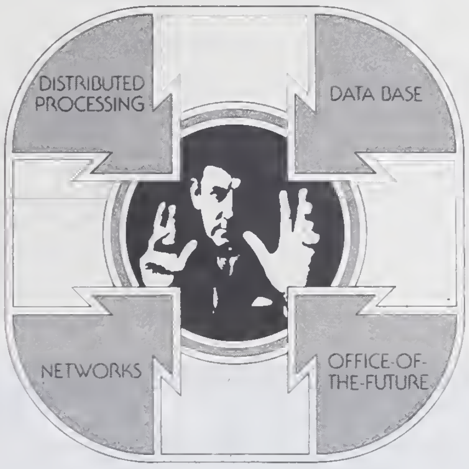
There is also a legal hangup about the confiscation of the computer, and it is not yet legally confiscated. The lieutenant indicated that "the longer they can hold off the hearing, the longer they can stay out and make book."

Eventually the wagering evidence wrested from the MPU will be presented in court, which will decide who of the listed bettors will be investigated and who among them will be subpoenaed to appear as witnesses against Rucker and the three others who were charged with commercial gambling, Diamond said.



'Gee, Nano, You Never Were Very Good at Strip Poker.'

THE NEW DP
REVOLUTION
DESIGN, MANAGEMENT & STRATEGY



JAMES MARTIN SEMINAR
SPRING 1980

ATLANTA	February 25 29, 1980
SAN FRANCISCO	March 3 7 1980
NEW YORK	March 17-21, 1980
CHICAGO	March 24-28, 1980

Call for information (213) 476-9747

TECHNOLOGY TRANSFER INSTITUTE
P.O. BOX 49765, LOS ANGELES, CA. 90049 (213) 476-9747

The Ohio Scientific C2-OEM is a typical microcomputer at a special price!

The Ohio Scientific C2-OEM is designed for business and industrial applications which can effectively use typical microcomputer speeds. But, that's where its similarity to others in its class stops.

- Full business configuration — standard.
- 48K dynamic RAM
- .35 MIPS 6502 CPU
- RS 232 port at 300 to 19,200 baud.
- Dual 8" floppies store 600Kbytes.
- OSI BUS oriented for modular expansion.
- Two slots in base machine; six open for expansion.
- Fast low overhead disk operating system — standard.
- Microsoft BASIC with random and sequential access files.
- Instant load disk bootstrap and front panel emulator in ROM.

$2699

The C2-OEM cabinet can be table top, rack mounted or incorporated in a matching desk which will accommodate a CRT terminal and printer. Industry standard parts provide very reliable operation and easy service. And best of all, the C2-OEM can make use of most of the business application software and accessories for the popular, premium performance Ohio Scientific Challenger III.

Available in OEM quantities at attractive discounts.

For literature and the name of your local dealer, CALL 1-800-321-6850 TOLL FREE.

OHIO SCIENTIFIC
1333 SOUTH CHILLICOTHE ROAD
AURORA, OH 44202 • (216) 562-3101

DP, Communications 'Like Scrambled Eggs'

WASHINGTON, D.C. — Computers and communications — which are "inexorably entwined" — constitute the U.S.' most important industry and will alter the future of all of us," according to Max Beere, vice-president of Imperial Computer Services, Inc.

Speaking before the annual conference of the Electronic Money Council here recently, Beere advised, "We must be acutely aware that when we are dealing with telephony we can't close our eyes to the fact that we're dealing with computers, or the complete reverse. . . .

Invisible Machine

"If you look for what most people believe is a computer, you'll find it's become invisible," the official of the Torrance, Calif.-based firm noted.

"It was only 25 years ago that the first stored-program-controlled computer was invented," he continued. "It cost $2.5 million and used enough power to move a locomotive.

"Today, taking its place, is a microprocesssor the size of a fingernail that is 20 times as reliable, consumes the power of a small light bulb, is one-thirty-thousandth of the volume, costs one-ten-thousandth as much and is available by mail order or in your local hobby shop," he said.

One result of the combination of computers and communications technology, Beere noted, is that competition is replacing legislation as a regulatory tool.

Media Competition

"This is more than a competition of technologies," he said. "It is a competition of media — satellites vs. telephone lines, pay TV vs. the movies, electronic funds transfer system vs. check printers, satellites vs. microwave systems and fibre optics vs. wire cable.

"The driving force behind this competition is technology," he said, adding, "The speed of the advancement of our technology is faster than man can comprehend."

He cited as a bureaucratic inconsistency the fact that the communications industry is highly government regulated, while computer companies are hardly regulated at all.

And yet, "a computer is in reality a communications system that has been compressed into a blue box," he said. A communications system, meanwhile, is a computer that is scattered across the country.

"The two are blended together like scrambled eggs," Beere said.

Meeting to Focus On Technology In Education

WASHINGTON, D.C. — The Third International Learning Technology Congress will explore innovations in educational technology at a three-day meeting Feb. 25-27 here.

Sponsored by the Society for Applied Learning Technology, the meeting will feature more than 80 speakers discoursing on such subjects as microprocessors in education, industrial videodisk systems and large-scale computer-based education.

Major Emphasis

The major emphasis will be on the application of learning technology in industrial, military and educational settings.

Before Feb. 1, the registration fee is $115 for society members and $125 for nonmembers. After Feb. 1, fees will be $125 for members and $135 for nonmembers.

The Society for Applied Learning Technology is located at 50 Culpeper St., Warrenton, Va. 22186.

Univac Users Set March Conference

SALT LAKE CITY, Utah — USE, Inc., a group of Univac Series 1100 computer users, will hold its spring conference here March 10-14.

The international organization will celebrate its 25th anniversary at the conference. It meets semiannually to exchange ideas and information to foster more efficient operation of members' computers.

The preregistration fee is $75. Registration at the door will cost $80. Registration or information is available from USE, Box 461, Bladensburg, Md. 20710.

The AGILE A1 Data Terminal is the ONLY 55 cps daisy wheel printer that users of Hewlett Packard's 3000 Series I, II or III can run at 1200 baud. Plus, the A1 is the only daisy wheel printer that interfaces with the new HP 3000 Series 33. The AGILE A1 Data Terminal (shown above) handshakes with the HP Enquiry/Acknowledge protocol (ENQ/ACK). It also provides users with firmware for proportional spacing and text justification. Just as important, the AGILE A1 enhances LARC (Los Altos Research Center) word processing software.

Here's what the A1 Terminal does.
With your HP 3000 Series I, II, III or 33, you get lots more than 55 character-per-second printing at 1200 baud when you use an AGILE A1 Data Terminal. You also can perform off-line data entry, text editing and word processing, including enhancements of the word processing software from LARC. The A1 terminal incorporates automatic justification of printed text to left margins, right margins, or both. It also includes dynamic intercharacter and word spacing, and the terminal can be set by the keyboard or program control to any character pitch. Printout from the A1 compares in quality to the very latest in photocomposition techniques. And you can choose from 50 different type styles, including special fonts for scientific, APL, legal and foreign language requirements. The terminal itself can operate at rates up to 9600 baud and functions with the HP Series 3000 at 1200 baud while producing 55 characters-per-second.

Graphics capability
The A1 has graphics capability for plotting in two different modes — Basic Plot and Superplot. With the AGILE A1, you don't need either a remote plotter or manual charting. In the Basic Plot mode, data points are plotted as they are generated by your program without previous layout of the entire graph in memory. Four controls monitor forward/backward horizontal movement in 1/60-inch increments, with upward/downward paper movement in 1/48-inch increments. Text can be added while the graph is being produced, printing forward, backward, vertically, horizontally or diagonally.

In AGILE's Superplot mode, you can produce graphics from 5 to 50 times faster than the Basic Plot mode. Superplot allows the A1 to move up to 14 increments in both horizontal and vertical directions simultaneously with a single character command. This eliminates slow incremental stepping to a plotting position at terminal speed.

Operator controls on the A1 terminal include a Selectric-style keyboard with the full ASCII character set, auto repeat and n-key rollover. APL keytops are optional. There is a separate 15-key number pad with 5 non-numeric characters. A single row of 10 illuminated function keys is provided, and there is a single column of four control keys. Margins may be set or cleared at any time in any column, and horizontal tabs may be set in any column. Complete specifications are shown on the reverse side of this sheet.

For information on pricing and shipping, contact:

AGILE

The AGILE CORPORATION
1050 Stewart Drive
Sunnyvale, Ca. 94086
(408) 735-9904

© 1979 Agile Corporation/Printed in USA

Founded by Science Fiction Buff

MPU-Based 'Junk Dealer' Ties Buyers, Sellers

By Ann Dooley
CW Staff

DECATUR, Ga. — "One person's trash is another person's treasure" is the philosophy of Irene Erlenwein, who founded a company that trades and sells used merchandise through an automated "junk dealer" system.

Started nearly two months ago, the Apple Pie Trading Post, Inc. stores information on items to be bought, sold or traded — information which is then matched with requests for similar items. Requests for specific items are also entered and stored, ready to be called up if the desired item is ever entered into the trading system.

All of Apple Pie Trading Post's items are kept in apple-pie order with a microcomputer system from — and this will come as no surprise — Apple Computer, Inc. The Apple II system has 48K bytes of memory, one disk drive, a modem and a soon-to-be-purchased printer.

Erlenwein formed the company "because I wanted a computer and needed something to go along with it." A science fiction buff with no computer experience, she originally wanted to start a computer store, but found that she didn't have the requisite working capital.

Instead, Erlenwein decided to capitalize on the fact that first, everyone is a bargain hunter and second, one person might be searching for what someone else is throwing out.

The Trading Post is intended to replace the often unrewarding search through want ads or other sources for items to buy or swap, Erlenwein said. People can find needed items in one place simply by calling up to request information from the data base. Clients and items are obtained by telephone inquiries, ads and by word-of-mouth.

Buyers can call in and get information about the items free of charge. If a specific item currently not on the file is requested, the client's request can be listed for a $5 fee for two weeks, Erlenwein explained. This will save people all the wasted energy of searching for an item at the risk of not finding what they want.

Three-Month Membership

A three-month membership is available for a fee of $10 to people who constantly have items they want to get rid of.

The Trading Post accepts ads from swappers and renters and also some personals. Items cover everything from garage doors to ponies to matching names for car pools. Small businesspersons, such as those in the import/export or salvage businesses, have expressed the greatest interest in the new service, according to Erlenwein.

Erlenwein bought primarily packaged software, such as a file cabinet program with 18 different data bases on one file, each of which can store more than 400 entries, in order to run the business. She has also read extensively on the subject, attends user group meetings to exchange information and has learned a great deal on the job itself, she noted.

Conference Set On Performance

PHOENIX — The 1980 Conference on DP Performance Management will be held Feb. 13-15 at the Scottsdale (Ariz.) Hilton Hotel.

Sponsored by Applied Computer Research (ACR), publisher of the *EDP Performance* and *EDP Performance Management Handbook,* the conference seminar will introduce the basic concepts of a program to manage DP performance and to assure user satisfaction with DP services.

Workshops will focus on key areas of the performance management function and will be chaired by managers with "hands-on" experience in that area.

The fee for the one-day seminar is $195 for nonsubscribers and $145 for subscribers. The two-day workshops fee is $200 and $150, respectively and the entire conference fee is $350 and $275. More information is available from ACR at P.O. Box 9280, Phoenix, Ariz. 85068.

Course to Cover Disaster Plans

WALTHAM, Mass. — A series of three-day disaster recovery workshops have been scheduled in four cities from February through April. The workshops, offered by EDP Security, Inc., provide a hands-on approach to the design, testing and maintenance of a corporate disaster plan.

Case studies will supplement workshop materials, and each student will begin to develop a disaster plan for his own organization.

The workshops, which cost $495, will be held in Boston on Feb. 6-8; in San Francisco on Feb. 20-22; in Washington, D.C. on March 24-26; and in Orlando, Fla. on April 14-16. More information is available from EDP Security, 400-2 Totten Pond Road, Waltham, Mass. 02154.

How do YOU avoid downtime?

This way? Or this way?

The choice is yours. Some IBM* computer installations can lose up to $5,000 per minute when the computer system fails. But that's only one reason why the T-Bar 3900 Series of Computer Peripheral Switches can save you money. If your system demands continuous on-line operation, call or write T-Bar today. Let us show you how other companies have used T-Bar alternatives to minimize downtime.

*or IBM compatible, such as Amdahl, Itel and CDC.

T-bar Incorporated®
141 Danbury Rd.
Wilton, CT 06897
203 762-8351

Show me how T-Bar can help to minimize downtime.
Name ____________
Company ____________
Address ____________
____

Transborder Data Policies Set as Rome Meeting Topic

ROME — The First World Conference on Transborder Data Flow Policies will be held here June 23-27. It is being organized by the Intergovernmental Bureau for Informatics (IBI).

Available now is a paper prepared by IBI that presents 27 political, economic, social, technical and legal issues. The paper will serve as a resource document for the conference.

Open to All

Open to participants from every country, the conference will offer an opportunity for representatives from developing countries to discuss new developments in information communication.

Attendees will also learn of legal and regulatory policies that may be required at national and international levels in the future.

The issue paper, preliminary conference program and registration information are available in English, French and Spanish from the IBI at P.O. Box 10253, 00144 Rome, Italy.

British Conference Slated Next Month

LONDON — Britain will hold the Third International Business Computing, Word Processing and Information Management Exhibition and Conference here at the Cunard International Hotel beginning Feb. 12.

The four-day event attracted more than 7,000 visitors when it was held last April. It was moved to the Cunard when it became clear that additional exhibition space would be needed, according to organizers.

Alongside such well-known U.S. firms as Hewlett-Packard Co. and IBM, British and European exhibitors such as BASF and International Computers Ltd. have taken large exhibition areas for the show.

Central to the show is an Information Management Conference, aimed at businesspeople on every level involved in information management. The six sessions range from a two-day introductory course for beginners to an intensive two-day program to develop advanced information management techniques, organizers said.

More information on the show is available from BED Exhibitions, Ltd., Bridge House, Restmor Way, Wallington, Surrey SM6 7BZ, England.

Nord Data 80 To Take Place In May in Finland

TURKU, Finland — Nord Data 80, an annual conference of Nordic computer specialists, will be held here May 27-29. It will focus on automatic data processing and office equipment.

Organized by the Turku Fair Corp., the conference will feature an exhibition of automated office equipment on May 27-30.

Besides "manual" office equipment, exhibitors will display microfilm equipment, minicomputers, word processing equipment, equipment for technical offices and office computers.

Further information is available from the Turku Fair Corp. (Osuuskunta Turun Messut), Puolalankatu 1 D 20100 Turku 10, Finland.

Call for Papers

1980 INTERNATIONAL CONFERENCE ON COMMUNICATIONS, Seattle, Wash., June 16-18.

Papers are invited on adaptive antennae, aerospace and electronic systems, antijam communications, communications command and control, communications electronics, communications software, communications switching, communications systems disciplines, communications and information theory, computer communications, data communications systems, electromagnetic compatibility, microwave theory and techniques, radio communications, social implications of technology, space communications, and standards coordination.

Authors should submit four double-spaced copies of the manuscript and abstract in English, not exceeding 3,000 words, as soon as possible to one of the following addresses as determined by region of residence: Asia — Dr. N. Kuroyanagi, Nippon Telegraph and Telephone, Musashino-Shi, Tokyo, 180 Japan; Europe — Dr. M. Urien, CNET, Route de Tregastel BP 40, 22301 Lannion Cedex, France; South America — Dr. J.P.A. Albuquerque, Rua J. Carlos 90/AP. 402, 22461 Rio de Janeiro RJ, Brazil; and North America and other regions — Dr. P.R. Metz, ICC '80, P.O. Box 88465, Seattle, Wash. 98188.

In Million-Word Encyclopedia

CPU Files Capture Work of 'Fairie Queene' Poet

By Jay Woodruff
CW Staff

CLEVELAND — Computer files called Chaos, Order and Topics are helping scholars here assemble dragons, damsels and giants into an encyclopedia on the works of 16th-century poet Edmund Spenser.

Under the direction of Prof. David Richardson of Cleveland State University (CSU), a computer will be used to assemble a one-million-word book to help readers understand and appreciate Spenser, best known as author of the epic poem *The Fairie Queene.*

Virtually every aspect of the encyclopedia's composition is to be handled by an IBM 370/158 with 2M bytes of memory. Organizers have already used it to determine all the categories they wish to cover, as well as to match scholars of Spenser's works with topics they may pursue for inclusion in the book.

By 1985, more than 100 of these international scholars will have contributed articles, which will be entered into the computer data base using Lear Siegler, Inc. CRT terminals.

The material will be formatted and stored on tape that will eventually be either converted into hard copy or input directly onto computer typesetting equipment, depending on how automated a system the book's publisher has.

Assembly Time Slashed

Not only will the assembly time be cut in half when compared with recent manual efforts to put out encyclopedias on the works of Shakespeare and Milton, but the information will be easy to update, access and revise on a terminal, the CSU professor explained.

The system was put into operation shortly after Richardson sent out 400 mailings to all known Spenserian scholars last April, asking for their participation and for topics they thought should be covered in the encyclopedia. The computer was then used to organize the 200 respondents into an alphabetical list of potential contributors and their topics.

Then, depending on the contributor's specialty or interest, CSU refined the list, assigning particular topics to the contributors. This file was called Chaos. It and other files used to refine the list and order the assembly of the book have been put together with the help of fellow CSU Prof. Harold Dailey.

Dailey was called in because he has gained much experience with computers in his work as a Victorian bibliographer, coordinating a work called *The Wellesley Index of Victorian Periodicals.*

"He's become quite good using the computer interactively for referencing bibliographic works," Richardson said, adding that Dailey uses a computer language called Spitball in preparing the Spenser files.

From 'Chaos' to 'Order'

Dailey has helped refine the Chaos file to cut out redundant topics. Similar entries were doubled up, and a new file called Order is now ready for further manipulation.

By September 1980, the file will be known as Topics and should represent the final form of the book. The scholars will then be assigned topics, with the first draft due seven months later.

As the drafts are input into the file, the file itself is expected to grow so large that it will not fit into the CPU memory. To remedy this, the file will be organized alphabetically and separated into files, by letter of the alphabet, that may be called up individually on the computer from tape.

In addition to cutting the time it takes to put together the encyclopedia, the professor said the computer should lower production costs and will easily be able to reflect Spenserian scholars' interpretations of the poet's works based on new research.

A computer is helping to sell the forthcoming book. "We're using it to mail flyers to every living Spenserian scholar and to every English department chairman in the U.S. and Canada," Richardson said.

Most DDP systems can be expanded somehow. But keeping your system cost-effective as your company grows —that's another story. Northern Telecom Systems Corporation has a collection of ways to ease your growing pains that's hard to match. Take a look—and think about where you're growing.

Starting small?

You can start a DDP system at any convenient size if you start with Northern Telecom. We have processors that work efficiently with just a single data station. Or with two. Or eight. Or sixteen. Upward compatibility makes it easy to use some of these processors in tandem.

Extra capability without excess capacity.

Our networking options let you link your processors for more processing power at the data station where it's needed. Easy access to all your processors means you won't have to buy excess capacity for peak loads in isolated places.

Our Multi-Task Operating Systems stretch the capacity of the data station still further. For example, each location can work on inventory, general ledger, receivables and order entry simultaneously. Even disk storage is unusually flexible—from .5 to 308 megabytes. So you never pay for more than you need.

We'll help you add big-time text-editing capabilities while a system is still small. So you can edit both files and programs in a speedy, simple way. Our text-editing ability saves programmer time. And it cuts the need for skilled people—because editing for any remote location can be done from any other location that has a programmer.

We speak your language.

You can start with any of four languages: COBOL, BASIC, RPG and TAL. And add any of the others whenever it becomes appropriate.

But it's not just our DDP systems that soothe your growing pains—it's our whole organization.

Right now, we can deliver state-of-the-art systems for Data Entry, On-Line and Remote Job Entry, as well as DDP. So when you work with Northern Telecom, one call can bring you factory-trained service for every part of your remote processing system.

The best reason to talk to us today is tomorrow.

Northern Telecom is combining data processing expertise with telecommunications expertise —a mix no other company can match.

Today, it means better access to all the processing power you pay for. Tomorrow, it means a smoother transition to the single system that will meet all your processing and telecommunications needs.

Talk to Northern Telecom Systems Corporation. Where computers and communications meet.

For the office nearest you, call our Marketing Services Department at 1-800-328-6760. In Minnesota call (612) 932-8202. Or write Northern Telecom Systems Corporation, Box 1222, Minneapolis, MN, 55440.

nt northern telecom

Northern Telecom Systems Corporation

EDITORIAL

The Software Challenge

"Software will be the focus of the data processing scene in the '80s, and commercial software — that is, off-the-shelf packages — may be the only realistic alternative for users if they are to keep up with their needs and match hardware's economic benefits."

That assessment by Werner L. Frank of Informatics, Inc. [CW, Dec. 31/Jan. 7] is hard to dispute and interesting to contemplate in the context of the country's economic situation.

Some eminent economists have ventured to predict, for various reasons, that inflation will simmer down in another year or two and that the companion problem of recession may already be bottoming out. Such optimism has the flavor of indefatigable faith in the ability of American managers to prudently adjust to economic vicissitudes.

Regardless of whether that faith is well-founded, there is no denying that managerial abilities in the decade ahead will be significantly constrained by the quality of available software.

As never before, the U.S. needs software packages that genuinely enhance productivity and efficiency. More specifically, users need *portable* packages to circumvent the hassles and costs associated with software conversion and bondage to particular, obsolescence-prone configurations of hardware.

The high rate of DP job turnovers points to a need for uniformity in DP resources and methods so users are not perennially left in the lurch by the departures of "key" programming specialists. "Off-the-shelf" packages, as Frank calls them, offer such commonality.

For the government's part, if any involvement in the software development scene is warranted, it is in economic incentives — whether passive, as with tax breaks, or active, as with subsidies — to whoever is trying to get high-quality packages to the marketplace.

State legislatures have, in some cases, been too hasty, if not greedy, in rushing to impose taxes on the lucrative software industry.

Software can do much in the fight against stagflation. But the extent to which packages can improve the economic picture is limited by the talent and skills of those who manage or apply them.

Great attention should also be paid to the organizational ramifications of software. For example, data base packages will do little good for users if their implementation is resented by critical nontechnical personnel.

In addition, adequate training facilities should be offered by educational institutions and the larger user bodies. Otherwise, so-called "powerful" packages may simply enhance the ability of some software staffs to create ill-fated monstrosities of high-level code.

This decade presents both an unprecedented challenge and an opportunity for the developers of software packages.

DATA PAST

Five Years Ago

Jan. 8, 1975

MONTVALE, N.J. — The Association of Data Processing Service Organizations charged that a Post Office regulation classifying DP materials as "letters" was grossly unfair to commercial DP firms, truckers, messengers, other delivery companies and, ultimately, to end users.

— — —

VAIL, Colo. — President Gerald Ford signed the first law governing the collection, use and dissemination of records in federal data banks.

Eight Years Ago

Dec. 29, 1971—Jan. 5, 1972

A look back at 1971 revealed that the top news for the year was the economy, with at least four out of the top 10 stories focusing on it. These were the closing of RCA Corp.'s computer division, the Nixon price freeze, users' liberation beause of a tight economy and IBM's cutting, then raising, prices.

— — —

HARRISBURG, Pa. — The president of the RCA Users' Association said most RCA users were "enthusiastic" about future relations with Univac.

'And if you think you're in over your head, not to worry — you can always become a manager . . .'

LETTERS

No Sympathy for Iranian

After reading the Human Connection piece intitled "Iranian DP Grinds to a Halt" [CW, Dec. 3] I was outraged. My outrage did not stem from the pulling of the plug on the computer subculture as the author would wish, but from the myopic attitudes reflected by the author and the lingering contradictions stated by the "unfortunate" Iranian DPer.

The Iranian stated that the systems with which he worked were devoted to police applications since the early '70s. The Shah's police systems were originally rather benign: payroll/-personnel. Then, they developed "a high-speed communications network to distribute stolen car notices to all the major cities in the country." Then, "of course, once the system was in place, it could be used for other applications, such as notices for 'wanted' persons."

Now, estimates vary — the Shah had liquidated, without trial, (a) 35,000 people, (b) 50,000 people, (c) 180,000 people or (d) 300,000 people. I find it appalling that we are enjoined to feel sorrow for the demise of a "computer system" that would have facilitated this liquidation or for the displaced systems personnel that were developing such systems.

It is true that the current government in Iran has violated international law relating to the inviolability of diplomatic personnel and has violated U.S. sovereignty by seizing the U.S. embassy in Iran. It is also true that the previous regime (i.e., the Shah) committed gross crimes against humanity, while the U.S. government looked the other way in order that we might have oil (oh, our precious cars!) and a buffer zone between Russia and the Persian Gulf (to protect oil shipments from the Middle East).

And yet we are treated to this poignant, tear-jerking, flag-waving final quote from our poor, displaced Iranian DPer: "But, as millions of immigrants who preceded me to America from other countries have found out, the United States of America is the one remaining refuge in the world today which offers a commodity far more important than all the oil in the Middle East, and that is freedom from tyranny."

Yes, I suppose that is true; and this offering is extended to the tyrannical (the Shah) and to the instruments of tyranny (our displaced Iranian DPer).

David Coles

Kaukauna, Wis.

Labor Recommendations

"Labor Grants Funds for Report Systems" [CW, Dec. 10] said the Labor Department study recommended Mark IV from Informatics, Inc. and Easytrieve from Pansophic Systems, Inc. as well as three other products. What are the other products?

David Gelperin

Hopkins, Minn.

The Labor Department study ended up recommending Culprit from Cullinane Corp., Data Analyzer from Program Products, Inc. and Asi-st from Applications Software, Inc. (in addition to Informatics' Mark IV and Pansophic's Easytrieve) for IBM-oriented installations; Extracto from System Development Corp. and Score (now from SDA Products, Inc.) for Univac 1100 sites; and IQ from The Management Group for Honeywell, Inc. shops.

Other readers have asked if copies of the 282-page report on the report writers, mentioned in the article, are available. Although they are out of stock currently, requests can be sent to Kenneth Wiram, U.S. Department of Labor Employment and Training Administration, Room 4410, Patrick Henry Building, 601 D. St. N.W., Washington, D.C. 20213. — Ed.

HUMAN CONNECTION/Jack Stone

Decade of Management Maturity Has Begun

Granting that the '80s will spawn even wilder technological growth than past years, I still believe that an equally significant change in the coming decade will be the maturing, at last, of the DP department management function. For this reason, I have prepared a new series, "DP Management in the '80s" of which this is the first article.

What better time than the start of a new decade for an agonizing reappraisal of how DP managers are running the store. Take, for example, the backlogging of the development of major systems, which for the majority of organizations ranges from a year to three years — a totally unacceptable operating situation.Because it demonstrates a lack of responsiveness on the part of the DPers — which is not totally their fault — the backlog has been a significant factor in reducing the effectiveness of the DP organization and its credibility, at least in the minds of the users.

Yet development demands will continue to intensify in coming years as user management strives harder than ever to use computer-based systems to streamline operations and cut unit labor costs.

An intractable backlog places a very heavy penalty on the organization. In-house systems development under this constraint is not only terribly costly but also an unhappy situation in other respects.

For one thing, development programmers are driven bonkers by short-fuse schedules and unlimited overtime. For a second, the data converters always have a horrible mess facing them.

A third problem is the miserable plight of the maintenance programmers who have to rewrite a lot of code that was not correctly designed in the first place. And a fourth is the absence of proper documentation and training support for all those people external to the systems development group who have a role to play in the system's success: users, executives, operators and so forth.

Ergo, a serious development backlog is a very important indicator of the health and quality of the DP function. Although significant progress has been made in trying to cut into systems development time by new design and programming techniques and methodologies, I submit that their net impact on the backlog of the typical company has not been perceptible.

New Directions

In the past, most executives have accepted the backlog situation as a necessary evil, but I suggest that they won't sit still for it in the future. They are going to come to the conclusion that a drastic redirection of management philosophy is necessary to reduce it.

There is much to be done to get control on the backlog, but perhaps the most important action — and the one that has great significance for the future growth of DP management — is the realignment of responsibility for data systems within the organization, namely away from that of a user/DP committee.

When you think about it, the typical firm or government unit handles its DP development function on a task force or steering committee basis, where design specifications are "negotiated" before they are cast into a soft form of "systems concrete," one that is pliable enough to accept change all through the construction process and long after the system is placed into operation. And the general attitude of the task force is that the user is the customer who, with the aid of the DPer, can determine the systems "need"; and the DPer is the consummate diplomat/scientist/pragmatist who can build and operate the systems "solution."

Well, the idea is sound but it hasn't worked very well in practice because, in general, relatively few users and DPers have obtained the background and experience necessary to fulfill their communal responsibilities in an efficient way. What's worse is that there has been little improvement in this situation over the years.

The solution? For starters, it may well be the time to give the DPers their due, elevate the DP department to an executive level in the organization and assign it the "line" responsibility for data systems — and all that is so implied.

READER COMMENTARY/Herbert Martenson

A Proposal for Gas Rationing

Computerized systems for gas rationing (as outlined in "Cards Better Than Coupons for Gas Rationing" [CW, Dec. 10]) are not readily acceptable in the political community.

Last June I sent copies of a system proposal similar in content to Gregory Enholm and Theodore Rueter's idea to about 50 politicians and Department of Energy (DOE) officials. DOE responded by saying it was committed to a ration stamp concept, period. Vague statements of support were obtained from two members of my state delegation. That was it!!!

A computer-controlled, credit card-oriented approach to fuel allocation and control can provide an economical and flexible means for managing this vital national resource. The mismanagement associated with current and contemplated manually based systems has already been amply demonstrated. A fuel stamp rationing plan would be ruinous to the nation even though it would serve some vested interests very well.

An opportunity exists for the DP community to provide leadership towards a solution of a national problem — if it can be organized. Here is my proposal. Let's hope the basic idea can gain enough momentum to warrant full and serious consideration by those in power in government and industry.

Herbert Martenson
Columbia, S.C.

— — —

I can recall the days of World War II and the gas rationing system used in that emergency. Ration stamps were a problem, subject to every form of abuse, but the system was in keeping with the times and the technology. We are now faced with a less drastic emergency but one with very long-term implications. The need for control of liquid fuel energy resources will continue as long as we use and produce internal combustion engines. The prospects of shortages in supply are real and time is an unforgiving factor.

A short-term coupon- or stamp-based fuel-rationing system is not appropriate to the problem or to the age in which we live. A computer-oriented approach not only provides a long-term vehicle for fuel supply administration but also is the lowest cost method we could employ. This proposal uses proven technology in a comprehensive system that is flexible, adaptable and designed so that it will not be a tax burden.

A short-term coupon- or stamp-based fuel-rationing system is not appropriate to the problem or to the age in which we live. A computer-oriented approach not only provides a long-term vehicle for fuel supply administration but also is the lowest cost method we could employ.

The author has no product to sell and no political ax to grind. This nation provided me with the opportunity to obtain twenty-five years of management and systems design experience and the initiative to seek a better solution to a knotty problem. Much help will be required to improve and implement the ideas contained herein. Yours will be appreciated.

Individuals will obtain a fuel allocation card (FAC) from their state driver's license facility. This card will be inserted into the pump control and recorder (PCR) in order to purchase gas. The PCR will be outfitted with a touch-type telephone keyboard. The purchaser will key in his personal security code (three characters), and the PCR will check its validity against the code read on the magnetically encoded card.

This feature will control the use of stolen or lost cards by unauthorized persons. (After two attempts to enter a correct security code the system will lock up and the station operator will be signalled that assistance is needed).

Upon acceptance of the security code, the pump will be turned on and the total gallons remaining on the allocation card will be visually displayed for the purchaser. Fuel will be pumped up to the limit of the value displayed, if desired. The system will not allow excess fuel to be dispensed.

When the purchase is complete, the recorder will subtract the number of gallons purchased from that originally available and record the new value on the magnetic stripe on the FAC. Simultaneously, a record of the purchase will be made on the station's automatic data recorder equipment. The FAC will be ejected by the PCR and the remainder of the transaction (payment) will take place.

If circumstances dictate that a fuel shortage (or abundance) is to be accommodated, retailers can be authorized to set the PCR to take more (or less) of the remaining fuel allocation per gallon delivered. For example, if a 10% reduction in fuel use (for an application) were directed, the PCR could be set to 110%. For every gallon delivered, 1.1 gallons would be deducted from the allocation available on the FAC. A display of this fact would alert the consumer to enable him to use judgment concerning the purchase.

The same procedure will be used to dispense fuel to individuals for business, boating, recreational vehicles, aircraft, nonautomotive and emergency needs. The FAC for these latter purposes will be separate and will contain added identifying data for these special uses. An affluent person may need as many as six cards to accommodate diverse interests and fuel allocations. While this may seem cumbersome, it permits the isolation and control of fuel usage by application. It is one element of the system design to minimize fraud, abuse and fuel diversion.

The data recorded by each retailer will be summarized by the equipment to establish substantiation for resupply by fuel distributors.

Distributors, in turn, will use their cumulative resupply orders to obtain fuel from their sources. The problem is more complex than that noted but this represents the gist of the procedure.

The data recordings will also be used by the state computer system and administrators to set priorities and allocation plans. Portions of the data will be completely analyzed to detect fraud and initiate investigative action. Summary data will be supplied to federal agencies and industry for use in overall guidance of the program.

In summary, the system:

1. Controls use of fuel by application.
2. Can easily adjust to changes in supply.
3. Keeps records of transactions for

(Continued on Page 40)

THE TAYLOR REPORT/Alan Taylor

Error 'Correction' Creates 577% Overcharge

Nowadays, disciplined system development techniques — whether generation, egoless coding or structured — have come so far that yesterday's mere frills of a good design are today's minimum requirements for standard productive software. Yet many installations and programs continue to show the scars of poorly thought out and obsolete systems work. One such is the Woodward & Lothrop Silver Club account shown here.

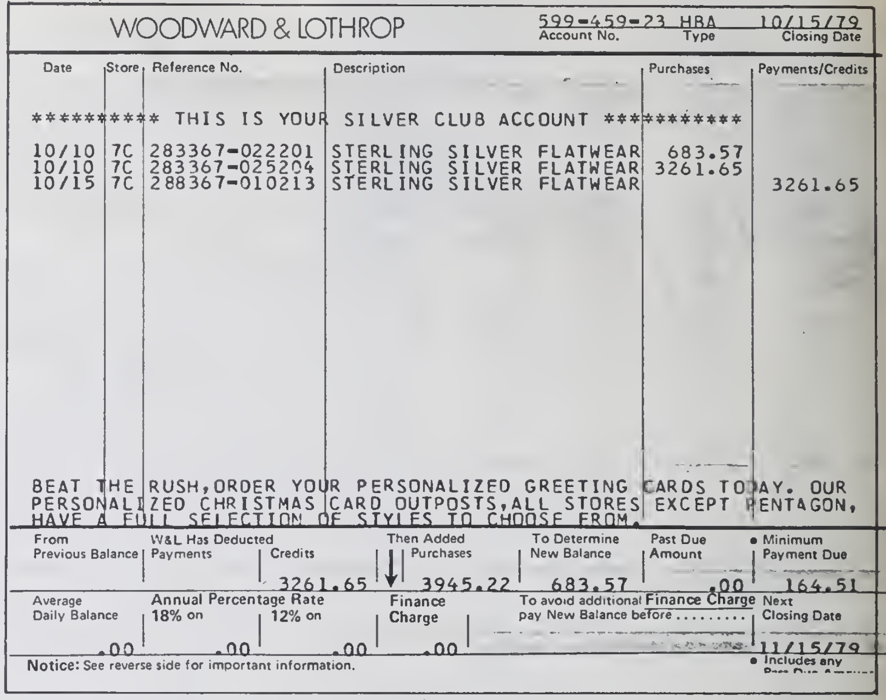
The story behind this account is that the Washington, D.C., store sold Rosemary Morrisey $683.57 worth of silver on a 24-month payment account. The problem was the validation routines of the system were set up so they accepted as legitimate input almost anything — as long as it came in the correct numeric form. The input $683.57 was OK by the validation system; and so was $3,281.65, no matter what account it actually came from.

Because of some error, an incorrect charge was made to the account, on its opening day in October, and passed through the less-than-100% validation routines. However, the error was found by the system five days later and before the close for October billing.

The Woodward Lothrop error routines credited only a "compensating" entry for the erroneous resultant balance — and the account was processed for mailing. Because of the inadequate error-retrieval system, the result was a 577% overcharge ($164.51 instead of $28.48).

The error routines failed to consider that other parts of the account were also wrong, not through the independent original misentry, but because the error-retrieval system was inadequate.

And this error even permeated the primary purpose of the monthly billing. The billing process's primary function is to notify the customer of the amount to be paid in the next installment — and this should have been one twenty-fourth of $683.57, or $28.48 or $28.49, depending upon where the accurate figure $28.482 is rounded. This would presumably have happened if the erroneous charge had not been posted to the account. Instead, the bill was sent out at more than six times the correct amount — $164.51.



WOODWARD & LOTHROP

599-459-23 HBA — Account No. — Type
10/15/79 — Closing Date

Date	Store	Reference No.	Description	Purchases	Peyments/Credits
********** THIS IS YOUR SILVER CLUB ACCOUNT **********					
10/10	7C	283367-022201	STERLING SILVER FLATWEAR	683.57	
10/10	7C	283367-025204	STERLING SILVER FLATWEAR	3261.65	
10/15	7C	288367-010213	STERLING SILVER FLATWEAR		3261.65

BEAT THE RUSH,ORDER YOUR PERSONALIZED GREETING CARDS TODAY. OUR PERSONALIZED CHRISTMAS CARD OUTPOSTS,ALL STORES EXCEPT PENTAGON, HAVE A FULL SELECTION OF STYLES TO CHOOSE FROM.

From Previous Balance	W&L Has Deducted Payments	Credits	Then Added Purchases	To Determine New Balance	Past Due Amount	• Minimum Payment Due
		3261.65	3945.22	683.57	.00	164.51

Average Daily Balance	Annual Percentage Rate 18% on	12% on	Finance Charge	To avoid additional Finance Charge pay New Balance before	Next Closing Date
.00	.00	.00	.00		11/15/79

Notice: See reverse side for important information.

• Includes any

The "Minimum Payment Due" here is 577% more than it should be.

A check of the details shows DP sloppiness — in this case, the continued use of manual conceptions of accuracy that increase the monthly amount charged. The Silver Club agreements call for either of two minimum payments, which are only equal at the manual-accuracy level of three decimals. The true minimum charge for a $3,945.22 total would be 13 cents less than the charged amount, which is based on 4.17% instead of the accurate 4.16667%. This six-digit number is quite long enough to give accuracy to the nearest cent. Or perhaps the store's computers cannot divide, but only multiply with a maximum of three digit accuracy?

What Woodward & Lothrop needs — as does any modern computer system — are error-recovery routines that actually reverse errors entered in the system, *at least for all external purposes.*

Compensating attempts almost always break down when examined in detail. Bank error systems, for instance, change the standing balance but leave the number of transactions and intermediate balances incorrect and inflated.

Modern Software

It is hard to write reversing routines without discipline. However, now we have discipline in the modern ways of programming. The lack of user-detailed specifications as to how to back out particular transactions does not excuse the omission of these provisions from DP operations. The user does not know the internal details of our systems, while the analyst certainly knows that errors occur and will need to be backed out properly.

The day of unprofessional error routines that do not remove the effects of internal errors has gone. DPers who do not include full-reversal systems — and rely on attempts to patch with so-called compensating entries — are following obsolete and dangerous practices. They should realize there are plenty of knowledgeable people around to catch them. Like reader Dan Morrisey, for instance.

© Copyright 1979 Alan Taylor. Reproduction for commercial purposes requires written permission. Limited numbers of copies for noncommercial purposes may be made provided they carry this copyright notice. The views expressed in this column do not necessarily reflect those of Computerworld.

If there's a DASD management system in your future...

Think PAC/Master.

And save up to 30% on Disk Space.

PAC/Master offers you a more efficient approach to DASD management. Designed for IBM OS/VS, this advanced DASD management system features a powerful selection facility which eliminates voluminous reports.

In addition, PAC/Master provides easy-to-read, comprehensive reports on every point of file structure.

Use it to produce special reports that simplify understanding of VASM clusters, data spaces and password usage.

And PAC/Master also allows you to tailor DASD usage rules to specific requirements and provides for a complete array of corrective actions —including scratch, delete, truncate, relocate, compress, archive, alter and move-to-tape.

Further, this exclusive system offers full archival/back up support; including high speed utilities, TSO interface, index of tape files, archive tape merging, index maintenance utilities, demand archival, and batched file restoration.

What's more, PAC/Master's easy to install, change and maintain. Plus it doesn't require a systems programmer to operate.

For additional information on saving disk space with PAC/Master—or to learn about our new Automatic Cobol Documentation System DCD II—simply drop us a note on your letterhead; or call us direct at (301) 948-9600.

cga SOFTWARE PRODUCTS GROUP
1370 Piccard Drive,
Rockville, Md. 20850
(301) 948-9600

Gentlemen:
☐ Have a salesman call ( ) ____
☐ Send me additional information on:
☐ PAC/MASTER
☐ DCD II
Name ____
Title ____ Phone ( ) ____
Company ____
Address ____
City, State, Zip ____

1370 Piccard Drive, Rockville, Maryland 20850 (301) 948-9600

LETTERS

A Matter of Comparison

Ruth Schiff Winett's assertion that "From an unabridged dictionary, careful writers learn that 'compare' takes 'with' and 'revert' takes 'to'"[CW, Dec.3] is too dogmatic.

The *Oxford English Dictionary*, for example, allows "compare" to be followed by either "with" or "to." Fowler's *A Dictionary of Modern English Usage* has an entry for "compare" which inspires the following example: "Joe compared System X to System Y"means that Joe indicated that the two systems were comparable or in the same class, while "Mary compared System X with System Y" suggests that Mary made a detailed comparison or demonstrated individual similarities and dissimilarities. *The Elements of Style* by Strunk and White contains a similar discussion.

In this light, when Shakespeare wrote, "Shall I compare thee to a summer's day?", he was certainly using *le mot juste*.

Henry J. Ricardo
Tappan, N.Y.

Childish Cartoon

For better or worse, *Computerworld* has become the standard news weekly of the DP industry. Thus, the editorial cartoon in your Dec. 3 issue struck me as remarkably childish.

Almost everyone knows of the recent embarrassment the North American Air Defense Command (Norad) suffered at the hands of its DP system. But while the result was perhaps more colorful than those of similar errors suffered by private industry — and the private press — the error itself resulted in nothing more serious than a few red faces.

Therefore, calling Norad "a bunch of idiots" is, to say the least, remarkably gratuitous. Having worked for a major DP publishing and consulting firm, I can assure your readers that operational screw-ups are hardly the sole province of the military.

In fact, I'll bet Jim Orton a bottle of whatever he drinks before he draws his cartoons that the closest he has been to a decision-making post in the military is as a critic of "F Troop."

Kenneth B. Sherman
So. Berlin, Mass.

'IBM Gotcha'

The new IBM policy change is significant. No longer do you have price protection under a lease vs. rental agreement with IBM. The lease arrangement only offers a discount on IBM MAC. There is no longer a 0% increase limit.

Were one to sign an agreement with the new price contract that IBM has for leasing, he could be hit within 90 days with a 5% increase, depending on the increase in IBM rates, and within a year of his contract, the difference, should it exceed 5%.

It is also significant that IBM had two major price increases during the short span of six months. Most people don't realize the impact of software product charges in the 4300 series. During the course of two years, prices under a two-year lease on the MLC can amount to 10%. There is no limit on software and maintenance charges.

Through the continuing process of changing of prices of MAC, MLC, purchase price, maintenance and software products, IBM can affect the future value of all products sold to customers today. It is interesting to note the increases on 158 and 168 prices, which are used to leverage users out of these particular systems.

Expect price changes every six months from IBM on all products in the future. These prices appear to be oriented to the new pricing of the H Series for the future. IBM, gotcha.

George S. McLaughlin
Summit, N.J.

Disaster Recovery Centers

"Disaster Recovery Centers Springing Up" [CW, Dec. 10] addressed an interesting concept and an area of service in which DP Brokers has been extremely active for almost five years. A vast number of private, corporate data centers as well as service bureaus in the Washington, D.C., metropolitan area have utilized our computer time brokerage services to provide them with this type of insurance. The primary difference is that our clients do not pay any retainers or monthly fees.

While some firms make primary arrangements with a specific center through us, they are all urged to contact us under any emergency conditions to ensure greatest efficiency. Our services are free to our clients; our commissions are absorbed by the time sellers.

It would appear that the three companies described by the author are charging an exorbitant price for the risk involved and it would further appear to me that these three companies face the same liabilities as their users, that is, they, too, could be struck by emergency conditions, such as power failures and fires.

While our services may be somewhat unique, it is our opinion that users would have better insurance by working through brokerage firms such as ours, whereby they would have access to multiple sites for emergency use.

Computerworld should present an honest picture of assets and liabilities when addressing disaster recovery centers and the need for proper protection at *justifiable* costs. Let's see an article addressing all options available.

Joan W. Johnson
President
DP Brokers
Vienna, Va.

Instant Data Entry.

No programming, no hassle, no delays.
With KEY/MASTER you can design new data entry applications for CICS in minutes, right from the terminal. So get your key-entry projects off the back burner. Get cooking with **KEY/MASTER.**®

For more information mail this coupon today to:

turnkey systems inc.
Customer Service Center
P.O. Box 416
Pelham Manor, NY 10801

turnkey systems inc.
A Division of National CSS

Or call your nearest TSI office:

Norwalk, CT
(203) 853-2884
Atlanta, GA
(404) 432-2149
Lombard, IL
(312) 629-6404
Southfield, MI
(313) 353-7430
Los Gatos, CA
(408) 395-6600
Dallas, TX
(214) 386-8604
Markham, ON
(416) 494-5987

☐ Send a KEY/MASTER brochure.
☐ Have a TSI representative call me.
☐ We'd like a demo.

Name ________ Title ________
Company ________
Address ________
City ________ State ________ Zip ________
Phone ________ CPU ________
WA00114

READER COMMENTARY/Bhairav Joshi

Day-of-Week Algorithm Works to 20,000 A.D.

Recent Reader Commentaries regarding day-of-week algorithms [CW, Aug. 27, Sept. 24 and Nov. 12] got me interested in developing one that will work for all dates from the year 1582 to about 20,000.

I have developed a straightforward algorithm based upon the Gregorian calendar. According to this calendar, in which the mean length of a year is equal to 365.2425 days, all years from 1582 (the year it was introduced by Pope Gregory XIII) to about 20,000 that are divisible by four are leap years with the following two stipulations:

a.) Of the centurial years (1600, 1700 and so forth) only those divisible by 400 are leap years.

b.) Of the millennial years (2000, 3000 and so forth) those divisible by 4,000 are not leap years.

I. An Algorithm for Finding the Day-of-Week on Jan. 1. Let me start by showing how I figure out the day of week (DOW) on Jan. 1, 1981 knowing that Jan. 1, 1980 (my reference day) is a Tuesday. There are 366 days in the year 1980 (a leap year), so that has 52 full weeks plus two extra days (ED). Counting Jan. 1, 1981, I have three EDs. Since the completion of a full week brings back the same DOW, I can find the DOW on Jan. 1, 1981 by counting three days starting with Tuesday — my reference day, as the day number 1. Thus, Jan. 1, 1981 will be a Thursday.

The important conclusion to be derived from this analysis is that with the passing of one full year (nonleap year), I get one ED of week, *and* I get an additional ED if the year was a leapyear. This observation can now be generalized as follows:

If n full years have passed since the reference date, with m of them being leap years, then the EDs of week will be equal to one plus seven residue of m+n−1, i.e., 1+[7|(m+n−1)], which is equal to the integer remainder of (m+n)÷7.

For example, the number of EDs from Jan. 1, 1900 to Jan. 1, 1980 would be equal to (1+[7|(19+80-1)])+1=2, where the last 1 counts the first day of 1980 and 19 represents the number of leap years in this period. This means that if Jan. 1, 1980 is a Tuesday (day number 2, according to this calculation), then the DOW on Jan. 1, 1900 must have been a Monday — day number 1.

Example (A): For Y=1900 I get

$L=(L_1,L_2,L_3,L_4)$=0.EQ.((4, 100. 400, 4000)|1900),
=0.EQ.(0, 0, 300, 1900),
=1, 1, 0, 0,
so that R=1-1+0-0=0, i.e., 1900 is not a leap year.

Example (B): For Y=2000 I get

$L=(L_1,L_2,L_3,L_4)$=0.EQ.((4, 100, 400, 4000)|2000),
=0.EQ.(0, 0, 0, 2000),
=1, 1, 1, 0,
so that R=1-1+1-0=1, i.e., 2000 is a leap year.

Figure 1

Similarly, the number of EDs from Jan.1, 0 (a convenient reference date) to Jan. 1, 1900 will be =(1+[7|(461+1900-1)])+3=3, where 461 is the number of leap years between the year 0 and 1900. Thus, if Jan. 1, 1900 was a Monday (day number 3, according to these calculations), then the DOW on Jan. 1, 0 must have been a Saturday.

II. Leap Years. Before going any further, let me step back a while and describe ways for determining whether a given year is a leap year and finding the number of leap years between any two given years.

To figure out whether a given Y is a leap year, I first calculate the 4, 100, 400 and 4000 residues of Y and save the result in an array A, that is A_1=4| Y, A_2=100| Y, A_3=400| Y and A_4=4000|Y, or A=(4, 100, 400, 4000)| Y. Next I test to see if the residues in A are equal to zero by evaluating the following relational expressions to get a logical result (0 or 1). These results are saved in the logical array, L: L_1=0.EQ.A_1, L_2=0.EQ.A_2, L_3=0.EQ.A_3, and L_4=0.EQ.A_4, or L=0.EQ.A.

Finally, I evaluate the alternating sum of terms in L: $R=L_1-L_2+L_3-L_4$. If R is 1, then Y is a leap year; if it is 0, then Y is not a leap year. The examples in Figure 1 illustrate this algorithm.

The question "How many leap years are there between Jan. 1, X and Jan. 1, Y?" can be most conveniently answered if I choose the year zero as my reference year. As an example, let me first calculate the number of leap years between Jan. 1, 0 and Jan. 1, 1900. From the definition of a leap year, it is clear that the year 0 is not a leap year.

The integer quotient of (1900-1)÷4, which is 474, gives the number of years between 0 and 1900 that are divisible by 4. The number of centurial years between 0 and 1900 is given by the integer quotient of (1900-1)÷100, which is equal to 18, and the number of millennial years in the same period is obviously equal to 1 — integer quotient of (1099-1)÷1,000. Furthermore, the number of years in the same period which are divisible by 400 is equal to the integer quotient of (1900-1)÷4, which is 4. Thus the number of leap years between Jan. 1, 0 and Jan. 1, 1900 is 474-18+4-1=461.

With a slight modification of the above procedure, I can generalize these results for the calculation of the number of leap years between Jan. 1, 0 and

(Continued on Page 42)

IMS EDUCATION

Adequate IMS Education is essential to the successful development of any IMS application. Finding adequate education has proven a major stumbling block to many companies. It is for this reason that many industry leaders have turned to Data Base Management, Inc., (DBMI) for IMS Education.

Now you, too, can solve your IMS Education problems by attending the following IMS courses being offered by DBMI.

1980 SPRING CLASS SCHEDULE

	Houston	Washington	San Francisco	Chicago
Introduction to IMS DL/I	Feb. 25-27	March 3-5 May 5-7	April 14-16	June 2-4
Introduction to IMS DC	Feb. 28-29	March 6-7 May 8-9	April 17-18	June 5-6
IMS Message Format Service	March 3-5	March 10-12 May 12-14	April 21-23	June 9-11
IMS Data Base Design	March 17-21	March 24-28 May 19-23	May 5-9	June 16-20
IMS Dump Reading	March 6	March 13 May 15	April 24	June 12
IMS Application Development Facility		April 1-3	April 28-30	June 23-25

DBMI DATA BASE MANAGEMENT, INC.
281 Hartford Turnpike
Vernon, CT 06066
(203) 646-3264

☐ Please send information regarding the Spring offerings
☐ Please send information regarding in-house offerings

Name ______ Title ______
Company ______ Phone ______
Address ______
City ______ State ______ Zip ______

READER COMMENTARY/J. Van Duyn

DP Professionals Write Quite Well

It may come as a great shock to Ms Winett (Ms without a period, because as reader W.P. McDonald pointed out [CW, Nov. 19], Ms is not an abbreviation), but DP professionals are not boors, and as a class they write quite well. Moreover, the majority of people who work in this field do not have a condescending attitude toward non-DP persons. Winett's articles, on the other hand, were permeated with condescension.

Case in point [CW, Nov. 26]: "Evidently, DP professionals are as creative as they are pragmatic. Some of the more whimsical terms in use are 'Fosdic' (shades of Fearless Fosdick); 'squirrel-cage magnetron'; a 'hit-on-the-fly printer' ('seven with one blow'); 'stunt box' (a relic from Houdini); 'floppy disk'; and the penultimate term, 'standing on nines carry.' What other professionals are as imaginative!"

Further, it's quite obvious from her article "Can't Speak Good; Can't Write Good, Either" [CW, Oct.29] that Winett does not know that Joseph Conrad, whose novels are masterpieces of the English language, could hardly speak English. Conrad was Polish, and he taught himself the English language.

Then there is Isaac Singer, who does not "speak good" English either, but who received the 1979 Nobel Price [sic] for literature.

These are only two of the many examples of great foreign-born writers, not to mention the many native American writers, who prove conclusively that "good speaking" does not necessarily mean "good writing." In fact, very often it means just the opposite.

Most successful salesmen, for example, are excellent speakers, while in general their writing is quite poor.

No Room for Cliches

Next, trivia and cliches such as "Yes, We Have No Bananas," "The Spice of Life," "Are You Listening, Gloria Steinem?" and on ad nauseam that Winett has used in these series of so-called "writing tips" articles have no place in any writing, and especially not in technical writing.

Insofar as "Computerese Gobbledygook" [CW, Nov. 26] is concerned, it may be gobbledygook to Winett, who has no knowledge of electronic data processing, but it is computer terminology to DP professionals. Consequently, her saying that "since computer terms have developed according to traditional language principles, gobbledygook in computer-related articles probably stems from the use of bad writing practices (dangling modifiers and run-on sentences, for example), and not from the use of an obscure vocabulary" is wrong.

Apropos, this is one of her many sentences that runs a whole paragraph. Yet she has the audacity to point a finger at "run-on sentences" in technical articles.

Next, let's examine what she calls "the ubiquitous bug." To begin with, since when is the word "bug" present everywhere in DP writing? You can read a dozen or so issues of *Computerworld, Datamation, Inforsystems,* and *Data Communications* and not find the word in any of the articles.

And her comparing "bug" with the cliche "fly in the ointment" is irrelevant and incorrect. "Bug," as any programmer could tell Winett, and as defined in the American National Standards Institute Vocabulary for Information Processing, is "a mistake or malfunction."

Finally, Winett's examples in her 10th article [CW, Dec. 3] are ludicrous. No technical writer would ever use such overly ornamental language as she is presenting in her Example 10: "He walked down the halls very casually, and one couldn't tell that his project was due the next day." Nor would any DP person use her "remedy": "From the way he sauntered down the hall, one couldn't tell that his project was due the next day."

And can any systems analyst or programmer/analyst who ever had to write a feasibility study, a project report, a technical proposal or a technical article imagine using language of Winett's Example 9? "In the hushed atmosphere of the computer room, sleek young priests minister to the waiting deity, the computer."

In Example 11, "Mistakes from using vague words," Winett again shows her lack of knowledge of computers by stating that it's wrong to say, "The computer went down because of a malfunction." Her "remedy" is: "The computer went down because the memory failed."

Somebody should tell Winett that computers do go down for other reasons besides the memory failing. That it is proper for the computer operator or any other DP staff who doesn't know what is wrong to tell the systems programmer that the computer went down because of a malfunction.

Van Duyn is a DP management consultant in Loomis, Calif., and the author of four books on DP.

THE FOUR MINUTE MILE WAS ONCE A DREAM

NCR Paper* was once a dream too

At one time, nothing could compare with the speed of carbon paper. Despite time consuming insertion, alignment, removal and disposal, it was the quickest way to make form copies. At one time.

Today, NCR Paper brand of carbonless paper accomplishes what the user of carbon paper can only dream about. It produces clean, legible, smearproof copies with rapid precision. And the paper that reproduces the message is the copy! No bulky carbon sheets. No extra storage space needed!

NCR Paper — the record holder. Setting the standards with the leader's pace!

We can even imagine a three minute mile.

APPLETON PAPERS INC.
GENERAL OFFICES: APPLETON, WISCONSIN 54912

*NCR Paper is a trademark of NCR Corporation licensed to Appleton Papers Inc

7658973214 EACH 12 6.55
754112435 EACH 4 43.50
TOTAL
CENTRAL INQUIRY
COBOL PROCESSING
DATA ENTRY
WORD PROCESSING

Now one distributed processing system does all four functions at every station.

We know that your remote users need more than one computer function. And we know that you want to avoid a proliferation of different systems to handle them.

That's why our powerful new **MFE/IV**™ Multifunction Executive system lets your operators perform all four primary office computer functions—data entry, standalone COBOL processing, word processing, and interactive 3270 inquiry to your central mainframe. All on one system. All at once.

Each function is instantly available at multiple display stations with the touch of a key. Our field-proven software packages operate concurrently and independently. And you get optimum use of both central and remote computing resources within a single unified information network.

Save money.

MFE/IV means bottom-line savings for your organization. Since each Four-Phase display replaces several dedicated terminals, you should need fewer of them. And you eliminate the cost and inefficiency of special-purpose systems, underutilized peripherals, and operator cross-training.

Save effort.

Your MFE/IV system keeps up with changing job requirements easily.

In a branch office, for example, while operators key new orders in fill-in-the-blanks formats, the system automatically retrieves and enters customer data from local files . . . price and delivery data from central files . . . and prints invoices. All while word processing and batch processing continue independently at other displays.

Grow step-by-step.

Our family of modular systems lets you grow at your own rate, saving time and money at each step.

Start by installing an economical system combining data entry and file management. Or word processing and batch communications. Or data entry, central inquiry and local processing.

Then grow to meet new needs. Add displays. Add memory. Add peripherals. And add software—with the Multifunction Executive for concurrent operation.

Let us show you how easy your move to distributed processing can be. Call your local Four-Phase Systems office for a personal demonstration. Or return the coupon for our MFE/IV brochure.

Yes, I would like to learn more about Four-Phase MFE/IV systems for:

☐ Data Entry ☐ COBOL Processing
☐ Central Inquiry ☐ Word Processing

Present mainframe and terminals.
____
Name ____________________________
Title ____________________________
Company _________________________
Address __________________________
Telephone _______________ Ext. _____
City ____________ State ______ Zip ______

Four-Phase Systems, Inc., MS 421F7-M
10700 N. De Anza Blvd., Cupertino, CA 95014
(408) 255-0900

CW 1/14/80

TM–Trademark of Four-Phase Systems, Inc.

Four-Phase Systems
The Distributed Processing Company

Computerized Gas Rationing. . .

(Continued from Page 33)

planning and control at many levels.

4. Contains security as well as fraud-detection safeguards.

5. Uses existing organizational entities for administration.

Each fuel user will obtain a plastic card. On one side of this card will be a photo and identifying information, the same as many states now use for their driver's license. On the back of this card will be two magnetic stripes. One will contain fixed identifying information in encoded form; the other will contain dynamically updated data concerning fuel used and available. Cards of this type are in use in many applications today. You may have one in your wallet.

Each fuel pump will be equipped with a control device that will perform the following functions:

1. Turn on the fuel pump (and shut it off if the fuel allotment on the FAC was used up).
2. Record data about the transaction.
3. Verify that the proper person is using the FAC by checking a personal (secret) access code.
4. Update the FAC with the amount of fuel remaining in the allotment.

Each issuing point for fuel allocation cards will require an encoding device to prepare the fuel allocation cards. This machine will be of unique design that combines the necessary facilities needed to simultaneously encode the FAC, keep records of issuance and produce visual copy of some of the identification information (name, address, and so forth).

Massive amounts of data will be generated by the system, too much for practical day-to-day administration. Control will be achieved via use of summary data, statistical analysis methods and distributed DP technology. This system will be used for fraud detection and control as well as for administration and planning. It will use conventional DP equipment such as is currently available.

Business needs will fall into a distinct subsystem designed to be somewhat self-policing. Each business, municipality and agency will be required to provide substantiation of gross organizational needs. An overall allocation will be made to each of these entities for their administration. Each organization will be free to "spend" its allocation in a manner suiting its priorities.

Each group wishing to administer a private plan for business reasons will acquire a card encoding machine in order to issue business authorization cards (BAC) to its employees. The card encoding machine will have a maximum limit programmed into its logic so that cards could not be issued for more than the total allocation. Other than that, the cards will be used in a manner identical to the FAC. The BACs would carry distinctive coding that would permit monitoring of their use.

Small organizations and individuals will be able to obtain their BACs from their local state agency.

The decision on how much fuel to allot to any one entity will be based on certified needs. Most companies and organizations already collect such data to serve Internal Revenue Service and operational requirements; therefore, no significant new burden will be placed on any group for substantiation of needs.

The allocations made at the beginning of a period will be subject to review upon (1) application of the organization or (2) analysis of usage. For example, a construction company may land a new contract and require a supplemental fuel supply. State allocation reserves will be maintained to accommodate such contingencies.

Recreational Activities

Noncommercial boat, RV, trailer and aircraft owners will receive a supplemental ration to sustain these activities on an equitable basis in the economy. Owners of these fuel-using machines will get a special FAC for *each* need upon separate application. Thus, the more affluent and complex lifestyles would be sustained (at some level) but not without some bother and cost.

The amount of fuel available for each recreational purpose will be set by the state fuel administrators.

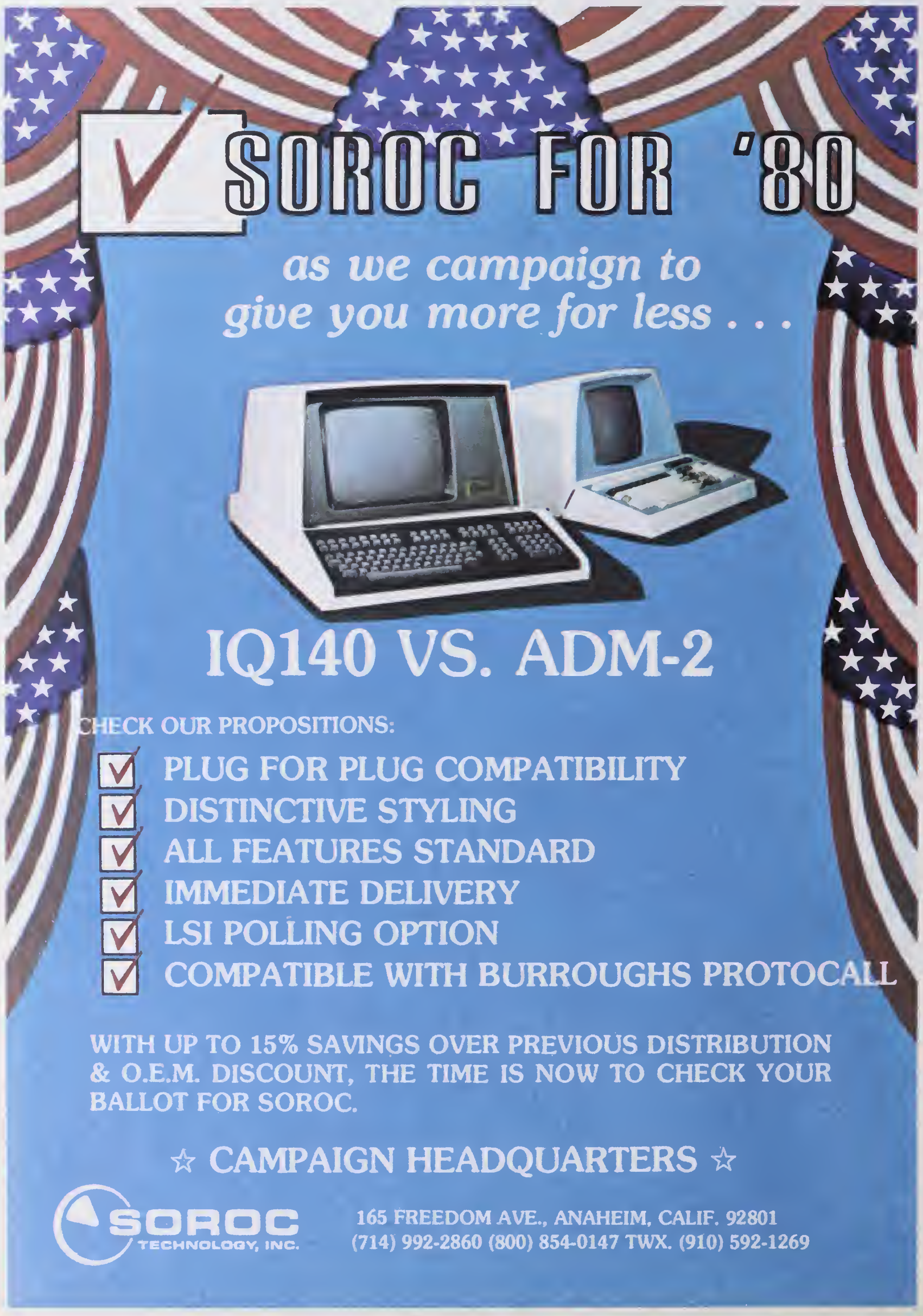
Tighter control over fuel usage could exist if it were made unlawful to use an FAC allotment for other than its intended purpose. This could forestall the purchase of a boat simply for the purpose of obtaining additional fuel for recreational driving in a gas-guzzling automobile.

Emergencies, Hard Luck

Individuals will need extra fuel to handle natural and self-induced emergencies. The system will accommodate these situations on a cost-plus basis in a manner that should minimize reliance on these measures.

A retailer will be able to dispense fuel outside of the controls of the basic system by selling emergency coupons at a surcharge of $2 per gallon. One dollar and sixty cents of this fee will be forwarded to the State Energy Office to offset the administrative costs of emergency issuance. Forty cents per gallon will be retained by the retailer to pay for the extra costs he incurs.

The coupons would be in the form of a common magnetic ink character recognition encoded check, single-ply form. Each retailer would have a controlled supply of these forms with his identifying information encoded on them. They would be only of use in his


SOROC FOR '80

as we campaign to give you more for less . . .

IQ140 VS. ADM-2

CHECK OUR PROPOSITIONS:

☑ PLUG FOR PLUG COMPATIBILITY
☑ DISTINCTIVE STYLING
☑ ALL FEATURES STANDARD
☑ IMMEDIATE DELIVERY
☑ LSI POLLING OPTION
☑ COMPATIBLE WITH BURROUGHS PROTOCALL

WITH UP TO 15% SAVINGS OVER PREVIOUS DISTRIBUTION & O.E.M. DISCOUNT, THE TIME IS NOW TO CHECK YOUR BALLOT FOR SOROC.

☆ CAMPAIGN HEADQUARTERS ☆

SOROC TECHNOLOGY, INC.
165 FREEDOM AVE., ANAHEIM, CALIF. 92801
(714) 992-2860 (800) 854-0147 TWX. (910) 592-1269

. . A Fair, Economical Approach

station, so thievery would not be a likely problem. A monthly summary report by each retailer of emergency issuances would be added to his other recorded data to provide a basis for complete resupply of fuel. All issuances over 10 gallons would be subject to investigation to avoid abuse of this system.

Costs, Funding Sources

The total cost of the FAC, including its issuance and control, should be about $6. Since the card would also serve as a driver's license or ID, the incremental cost would be less.

The pump control and recorder will vary in cost depending on the type of pump. The per pump cost is estimated at $200. The cost of installation should vary between $20 and $50 per unit. Larger stations would require a more complex data collection system as an adjunct that would cost about $2,000. These systems would be custom-designed to suit the circumstances involved with modular components. The cost of these units could be financed from the excess profits (tax) derived from oil deregulation. However, since retailers would receive tangible benefits from the use of PCRs, it may be acceptable for them to share some of the costs.

The cost of communications and computer systems would depend on the sophistication of the controls desired. A nationwide network would probably cost in excess of $10 million at the federal level. This could be financed via excess oil industry profits or as a cooperative venture with the oil industry. Each state would also have a subnetwork of a size that would suit its needs for administration (to a national standard). Some of the equipment is already in place to serve the driver's license function. The incremental costs would be considerable to add on the fuel control application. The charge made for the FAC should be adequate to cover this added administrative cost.

Inevitable Cheaters

Despite safeguards that are part of the system design, there will be cheaters. Investigation and prosecution of violators will be an expensive phase of the overall plan. These costs should be borne entirely by the offenders. Fines should be levied on a cost of prosecution basis plus overhead to keep this part of the program self-liquidating.

The FAC fee should be adjusted to keep the program on a break-even basis. The whole point of the system is to assure a predictable supply of fuel. Users, as the direct beneficiaries, should pay for its upkeep.

The data collection and analysis system will be comprehensive. It will be designed to manage the nation's most ubiquitous, valuable and scarce resource on a timely basis. It should serve the oil industry, business, farming and the general public with equanimity.

The system will be administered primarily at the state level. The states, with rare exceptions, will allocate fuel to all organizations and individuals resident in the state, including federal agencies.

All states will have to use the same system to simplify matters, accommodate mobility, reduce costs and provide for fraud detection and other control methods.

The federal level of operation will be geared to assist and supplement state systems, not to control and dominate them.

All machines used in the system will have "hard-wired" program logic. Tampering with the machines or their components will require special facilities, technical expertise and foolhardiness. Cheating on the system will not be impossible, but getting caught will be a likely result.

In Conclusion

The application of imagination will indicate how the many circumstances not delineated can be handled. Furthermore, as the cost of computer technology continues to decline, the system can be readily enhanced to provide even more positive control over fraud and abuse.

The technology exists, the capability exists and the need exists. Time for inaction does not exist. It will take several years to get the program going even if excellent support is provided. Listed below are but some of the steps required.

1. Obtain authorization and funding for further study of the proposal.
2. Obtain views of state and federal officials on a "fleshed out" proposal.
3. Develop comprehensive implementation plans incorporating suggestions received.
4. Draft legislation and regulations required at state and federal levels.
5. Obain approval of the (by now) fully developed plan by governors and congressional delegations.
6. Enact enabling legislation.
7. Develop staff for development and implementation.
8. Obtain bids and start equipment production.
9. Install system in one state or region to debug.
10. Go full scale as facilities become available.

I hope you will agree with the need for action and will use your influence to get things going on a concerted basis.

Martenson is a consultant specializing in management and DP planning.

Announcing

The first national data entry service

Data Entry Services of America

DESA

Now, a national service company to help you mind your data entry business

If you manage the data entry function, or depend on it, you're well aware of the turmoil that's created when workload peaks, personnel shortages, end-of-period requirements, or special applications tax your resources beyond their limits. And you know the time and effort required trying to find an outside data entry service that could handle your volume and turnaround requirements. Consistently. Competently. Competitively.

Now, you can meet those needs in stride, with DESA — Data Entry Services of America.

DESA provides these data entry services nationwide with the largest dedicated personnel-equipment resource in the industry, and backs it up with experience that comes from handling requirements for users in business, industry, government, and services. And enhances it with the expertise that provides on-time delivery, on-target accuracy, and on-budget costs.

That's what you want in a data entry service, and what you'll get from DESA — large enough, capable enough, competitive enough to be the first national data entry service. Find out why.

Data Entry Services of America
DESA

DESA, Inc.
National Headquarters
Two Plymouth Commons
Plymouth Meeting, PA 19462
215-825-9080

Data centers located in Atlanta, GA; Dayton, OH; Detroit, MI; Kansas City, MO; Minneapolis, MN; Philadelphia, PA; and Spring Lake, NJ.

YES, I would like to learn how you can help me mind my data entry business.

☐ Please have a salesperson contact me to discuss my data entry needs.

☐ Please send more information.

Name ______

Title ______ Phone ______

Company ______

Address ______

City ______ State ______ Zip ______

CW1140

Algorithm Finds Day of Week to 20,000 A.D.

```
    ∇ DOW D;M;R;T

[1]   M←12ρ7ρ 31 30

[2]   M[2]←28+-/0=(T←4 100 400 4000)||R←2↓D

[3]   R←R+-/⌊(¯1+|R)÷T, 1000 2000

[4]   R←1+7|¯1+R+D[2]++/(¯1+1↑D)↑M

[5]   (7 9ρ'SATURDAY SUNDAY   MONDAY   TUES

      DAY  WEDNESDAYTHURSDAY FRIDAY   ')[R;

      ]

    ∇
```

Figure 2

(Continued from Page 36)

Jan.1, Y. If I define X=Y-1, and evaluate the following integer quotients — A=X÷4, B=X÷100, C=X÷400, D=X÷4,000, E=X÷1,000 and F=X÷2,000 — then the desired number of leap years is = A−B+C−D+E-F. The validity of this algorithm can easily be checked.

III. A DOW Algorithm when the DOW on Jan. 1 is known. Having shown the algorithms used for figuring out whether a given year is a leap year, finding the number of leap years between Jan. 1, 0 and Jan. 1, Y and figuring out the DOW on Jan. 1, Y, let me now turn to the problem of finding the DOW on any other date in the year Y.

As an example, let me find the DOW on Oct. 5, 1981. As shown earlier, Jan. 1, 1981 will be a Thursday. First, I note that 1981 is *not* a leap year. Thus, the total number of days since (and including) Jan. 1 is (31 + 28 + 31 + 30 + 31 + 30 + 31 + 31 + 30) + 5, which is equal to 278. So that the number of EDs will be, as shown before, 1+[7|(278-1)]=5. The DOW on Oct. 5 will be the fifth day counting Thursday (Jan. 1, 1981) as the day number 1. This makes Oct. 5, 1981 a Monday.

IV. A General DOW Algorithm (summary). My general algorithm starts with the knowledge that Jan. 1, 0 (my reference date) was a Saturday as proved above. I assume that the user of my algorithm is interested in finding the DOW on the date (Gregorian) M/D/Y, where D represents the day of the month M in the year Y. The five-step procedure for finding the DOW on M/D/Y is:

Step 1: Find whether Y is a leap year (See Section II).

Step 2: Set up an array containing the number of days in each month of Y. If Y is a leap year (Step 1), then the second element of this array is 29; otherwise, it is 28.

Step 3: Find the number of EDs from Jan. 1, 0 to Dec. 31 (Y-1). This is equal to Y plus the number of leap years between Jan. 1, 0 and Jan. 1, Y (See Section II).

Step 4: Add the number of days in the year Y up to, and including, the day number D of the month M. Results of Step 2 are used to do this.

Step 5: Add the results of Steps 3 and 4 and call it Z. The number corresponding to the DOW (using 1 for Saturday, 2 for Sunday and so forth) on the date M/D/Y is then equal to 1+[7|(Z-1)].

V. An APL Program: DOW. I have implemented the general algorithm for finding the DOW discussed here using APL. The five-line program, called DOW, is shown in Figure 2. Here is what the program does:

Line [1] sets up a 12-element array containing the number of days in each month.

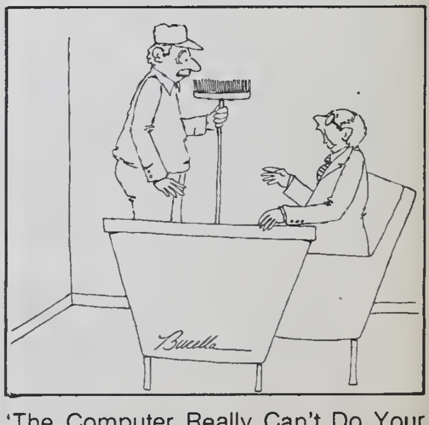
Line [2] sets up the proper value for the number of days in the month of February of the year Y by first figuring out whether Y is a leap year.

Line [3] calculates the total number of EDs from Jan. 1, 0 to Dec. 31, (Y-1).

Line [4] calculates the day number for the date M/D/Y counting Saturday (Jan. 1, 0) as the day number 1.

Line [5] prints the name of the DOW.

Joshi is an associate professor in the Department of Chemistry & Computer Science at the State University of New York at Geneseo.



'The Computer Really Can't Do Your Job, Benson, But I Have To Let You Go So I Can Save Enough Money To Pay For It.'

Take a close look.
The VISUAL 200 not only emulates competitive terminals ...it obsoletes them.

The keyboard and rear panel of the VISUAL 200 tell the story. In addition to switch-selectable code-for-code emulation of Hazeltine 1500, ADDS 520, Lear Siegler ADM-3A and DEC VT-52 terminals, the VISUAL 200 has power and versatility they simply can not match. On top of the features in the illustration, other standard features include: 7x9 dot matrix characters with two dot descenders, smooth scroll, tilt screen, self test, dual intensity, blink, blank, line drawing, cursor addressing, read cursor and read terminal status.

And you'll be as impressed with the price as you are with the terminal. So take a close look. Call or write for full details or a demonstration.

VISUAL See for yourself

Visual Technology Incorporated
Railroad Avenue, Dundee Park, Andover, MA 01810
Telephone (617) 475-8056

VISUAL
200
OPTIONAL SINGLE ACTION FUNCTION KEYS — PROGRAMMABLE IN BLOCK MODE
MOVABLE, SOLID STATE KEYBOARD
SELECT CHARACTER MODE OR BLOCK MODE
CURSOR CONTROL KEYS
SHIFT KEY FOR UPPER/LOWER CASE
SPECIAL KEY TO ENABLE EDITING FUNCTIONS OFF NUMERIC PAD AND CURSOR CONTROL KEYS:
• INSERT/DELETE LINE
• INSERT/DELETE CHARACTER
• SET COLUMNAR TAB
• CLEAR COLUMNAR TAB
• ERASE END OF LINE/FIELD/PAGE
• CLEAR PAGE
• CLEAR LINE
NUMERIC PAD FOR FAST DATA ENTRY
FULL OR HALF DUPLEX USING CODE TURNAROUND OR SECONDARY CHANNEL
50 or 60 HZ REFRESH
BLACK ON WHITE OR WHITE ON BLACK VIDEO PRESENTATION
COMPOSITE VIDEO OUTPUT
PROGRAM SELECTION FOR TERMINAL EMULATIONS—HAZELTINE 1500, ADDS 520, LEAR SIEGLER ADM-3A AND DEC VT-52. (VISUAL 200 NATIVE)
PARITY CONTROLS
BAUD RATE CONTROLS UP TO 19,200
COMP. VIDEO
AUX. PORT
EIA
KEYBOARD
SELECTABLE DATA WRAPAROUND
SELECTABLE NEW LINE ON CR
SCROLL OR PAGE MODE
REAR PANEL CONTROLS
SERIAL PRINTER PORT
EIA AND CURRENT LOOP INTERFACES

IBM-Based Users Report:

Package Cuts Costs of File Copying

By Don Leavitt
CW Staff

At a time when some high-performance software packages can cost $50,000 and more — and be judged well worth the money — a $1,500 utility package is getting increased attention for the savings it can provide user sites.

Faced with the need to wring more information from flattened DP budgets, managers of IBM sites are looking at areas of their operations they've previously ignored, in an effort to get more for their money. The file copying function, often the second most heavily used utility (after sorting) and frequently one of the top resource consumers, is one such area.

That's where Copymacs from Management and Computer Services, Inc. (Macs) comes into the picture. It was designed to outperform and therefore replace IBM's IEBGENER, which installations have been taking for granted for file copying, with little attention paid to its impact on either CPU or elapsed time.

User Survey

A survey of Copymacs users indicates the Macs software lives up to the vendor claims. Cybernetics & Systems, Inc. of Jacksonville, Fla., for example, conducted a study and found that as much as 4% of all CPU time was devoted to servicing the file copying function.

Systems Manager Jim Gunn said "that was an important number for us, since our IBM 370/165 was overloaded and we were looking for a way to get even more capacity from the machine. Copymacs was a big help in that regard."

He noted that Copymacs freed CPU time and helped reduce charges to his users even while it was paying for itself within two months.

Gunn never used extravagant adjectives to describe Copymacs: "It's one of those nice software products" that do the job they were meant to do. Period.

A manager at a major Blue Cross plan in the Midwest agreed there was no dramatic payoff with Copymacs, but added "everything in this business does not have to be a headline maker to produce benefits.

"We run some 3,000 file copying executions a month, and we expect to pay for Copymacs within a year. In a time when DP budgets are tightening up, if you can buy a product at a low cost and pay for it in a year and reap its benefits for years after that, you've done your company — and yourself — a service."

Safeco Insurance Companies was familiar with Macs, having been a user of the Datamacs test data generator for more than six years, so it saw little up-front risk in trying Copymacs. Eric Gulotta, software support supervisor for the Seattle-based firm, knew that file copying was the fifth most heavily used utility in his dual IBM 370/168 shop, with more than 66,000 executions last year.

"We monitored very closely the effect of Copymacs on our file copying function and realized that if we could reduce CPU time

(Continued on Page 44)

Software Ready to Help Implement Methods of Structured Management

SCOTTSDALE, Ariz. — A software system based on the structured management methodology described in Volume 1 of the *EDP Performance Management Handbook*, published by Applied Computer Research, Inc., is now available from Performance Management Associates, Inc. (PMA).

The Costanalyzer package is said to aid in capacity planning and budget preparation for the planning, development and operations functions within DP organizations. Both hardware and staff resources may be included, a PMA spokesman noted.

Written in PL/I, the package uses measurement data taken from the organization and a forecast of its work load to compute estimates of its staffing and hardware requirements in each functional area. Basic expense data supplied by the user is then applied to produce budgets necessary to support that staff and hardware.

Cost Calculations

Standard cost information is computed, both for internal tasks or units of work — "$16.38 to schedule a job" or "$.003 for one tape I/O operation" — and for units of work expressed in external or user terms — "$125 per payroll run" or "$3.28 per paycheck," the spokesman said.

Once input data is coded during implementation, Costanalyzer only requires enough processing time to translate work load forecasts into budgets, and that is usually dependent on the turnaround time at the user's installation.

Utilization data for internal resources is computed and checked against control limits defined by the user. This allows inclusion of service level simulation in the budgeting cycle, according to PMA.

Initial installation of the Costanalyzer program is on a selective basis. Interested organizations can contact PMA through P.O. Box 4605, Scottsdale, Ariz. 85258.

S/34 Diskette Magazine Libraries Handled by 'FCU' From N.Z. Firm

AUCKLAND, N.Z. — The File Copy Utility (FCU), developed by Martin Spencer & Associates Ltd., keeps track of generations of diskette files on IBM System/34s with magazine drives that can hold as many as 10 operator-accessible diskettes.

The utility was created because the organization of diskettes in magazines requires "some thought." The main practical problem associated with use of the magazine is the conflict between wanting as little operator intervention as possible — "that's the main reason for using the magazine" — and wanting to save data files selectively, a spokesman said.

The difficulty in saving selective files lies in keeping track of just where the various generations of a file are, he continued. The latest version of a file may be on a daily magazine rather than on the weekly magazine that is currently being backed up.

Disk File Backup

FCU can back up disk files, which may be defined individually or grouped into sections, to individual diskettes or to magazines. It also allows the user to restore disk files selectively by generation, either individually or in sections from diskette.

The utility may also be used to copy disk files — individually or by section — to another part of their current disk and to track up to nine generations for each file specified, according to the spokesman.

FCU can prompt the operator to insert magazines with particular labels when required and "cuts down the shuffling of diskettes within the drives," he added.

The package costs $450 and can be ordered from Spencer at the National Mutual Building, Shortland St., P.O. Box 2502, Auckland, N.Z.

"During our 4300 conversion, DOSSIER told us where every file is touched by an application program."

"In many cases we recovered 40-50% more file space..."

"For the first time, we can audit and control production libraries..."

"I don't know how a data center could exist without it."

Skip McNeil
Manager of Data Processing
PHA Life Insurance Co.
Portland, OR

PHA is one of more than 400 companies to have already discovered DOSSIER — the unique software system that analyzes object code to provide invaluable program and file information.

DOSSIER's 16 management reports tell which programs access which files. They simplify plugging in the best block and control interval sizes. Identify all subprogram relationships. Control production libraries. And much more... automatically!

Try DOSSIER free, without obligation, for 30 days. In upgrades, maintenance and cleanups of DOS, DOS/VS or DOS/VSE libraries, DOSSIER can pay for its $85/month cost in a single day.

For more information, just clip this ad and mail to Computer Concepts Inc., 6643 Beaverton Hwy., Portland, OR 97221 Or call 503/297-4741

Documentation & Standards Tool
a product of
CCI

'Demand 90' Aids DEC Users in CRT Work

BAY CITY, Mich. — Intended to give novice users practical CRT data management in a Digital Equipment Corp. Decsystem-10 or 20 environment, the Demand 90 Video Transaction Management System is heavily "human engineered," according to the vendor, the software division of Olamic Systems Corp.

Anyone with basic typing skills can immediately use the system for interactive CRT forms design, on-line transaction preparation, formatted CRT and hard-copy data display and data base file maintenance, the spokesman claimed.

System features are said to include both terminal and screen independence, programmerless CRT formatting, automatic data dictionary creation, automatic audit trail and both CRT image and data base encryption. The package is compatible with existing Ascii, Sixbit and binary data files, he added.

Demand 90 supports sequential, direct and relational CRT and hard-copy display, and a macro capability includes the ability to preset programmed function keys and to utilize predefined procedures.

Concern for End User

Reflecting still more concern for the end user, the system is being extended to allow the user to alter the syntax and the language of all commands to any language. English is a good vehicle for many, but French, German or Norwegian might suit others better: this way they can have what they need, the spokesman pointed out.

Demand 90 is said to support "a wide variety of low-cost CRT devices" currently, but the vendor did not specify any units beyond those supported by DEC's operating systems.

An interface to System 1022, the data base management system from the Software House, is planned for release in the next three months, he added. Demand 90 carries a one-time fee of $14,700.

Olamic's software division is at 503 N. Euclid Ave., Bay City, Mich. 48706.

Package Chops Copy Costs

(Continued from Page 43)

in that function by as little as 10%, Copymacs could pay for itself within five years.

"As it turned out," he continued, "we're actually saving considerably more of both CPU and elapsed time during the copying function, so Copymacs will pay for itself even sooner."

In addition, Gulotta noted that since his shop is getting more efficient use of its resources, there are indirect benefits being gained from Copymacs.

CPU Time Savings

Merlin C. Becker, manager of DP operations at Aid Association for Lutherans (AAL) in Appleton, Wis., recommended Copymacs because he saw a "potential return on investment of 35% in one year using Copymacs instead of IEBGENER." He noted that AAL executed IEBGENER 60 times a day for production and testing.

"In testing Copymacs vs. IEBGENER to copy files, we experienced a 52% savings in CPU time. Based on system utilization, IEBGENER would require about 17 CPU hours in 1979. At $700 per CPU hour, IEBGENER would cost $11,900 per year to copy files. The savings from Copymacs would be 50% of that or $5,500."

Besides the CPU time savings, Copymacs gave Becker the number of records it had read and the number written. IEBGENER just gave an End-of-Job message "so we had to assume all the records were copied. Copymacs also lists data set names, DCB attributes and volume serial numbers."

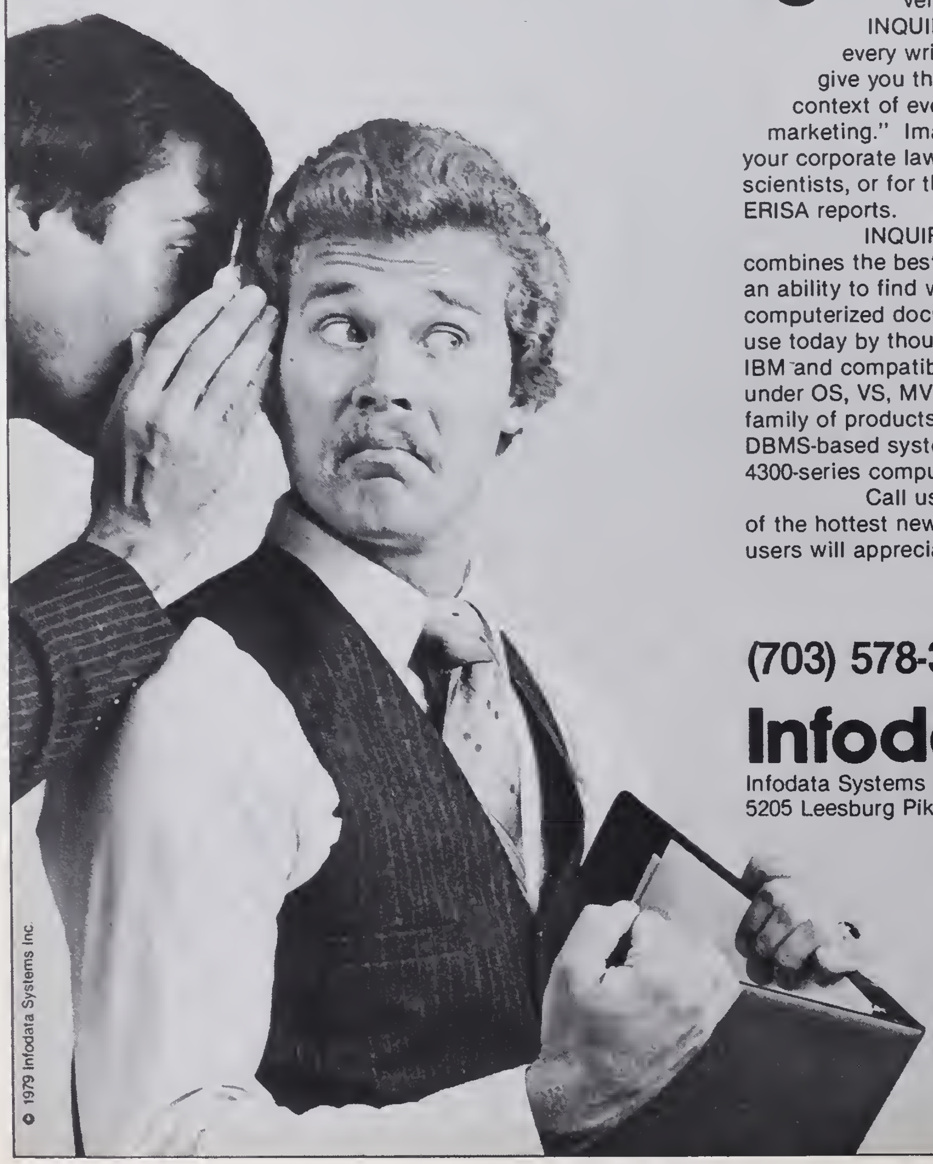
Tom Carr, who is assistant director of DP services for the Blue Cross/Blue Shield/Delta Dental plans in Louisville, Ky., was taken by the understated way Macs referred to potential Copymas benefits. "We compared Copymacs to IEBGENER and showed a conservative savings average of 45% in CPU time. The highest savings was 75% and the lowest was 41%."

IEBGENER used 2.55 CPU hours a month and installation of Copymacs was projected to cut that figure to 1.4 CPU hours. "Using a conservative ration or 8-to-1 elapsed time to CPU time," Carr explained, "this meant a savings of 11.2 elapsed hours of run time per month.

"IEBGENER is used in our company primarily to archive 3850 MSS data sets to tape, and approximately 30% of the projected IEBGENER jobs have been installed for this purpose.

"Therefore," he concluded, "the projected savings over IEBGENER when all of these jobs are implemented is an impressive 37.3 elapsed hours per month. And we have found that on the average it performs better than Macs said it would."

Maremont Corp.'s Fred Weyler didn't make the Copymacs decision quickly, even though he could foresee the 40% improvement over IEBGENER. "I became aware of other products, but learned that while they might be functionally similar to Copymacs, they didn't offer all its capabilities. For the dollars involved, there was no need to gamble on a product or company without the kind of track record of Macs."



"INQUIRE® Now does Electronic Text Searching"

The secret is out. Infodata has coupled a complete text and document searching system into the INQUIRE database management system.

Now you can gather information, update records, write reports, and run your business efficiently as a DBMS will help you to do. Plus, you can do extraordinarily inexpensive research for product development, litigation support, or government reporting...with the computer and INQUIRE/TEXT.

For example.

Suppose you want to know if anyone has ever written a report on "vertical marketing."

INQUIRE/TEXT can search every written report on file and give you the exact location and context of every reference to "vertical marketing." Imagine the time savings for your corporate lawyers, for research scientists, or for those EEO, OSHA or ERISA reports.

INQUIRE is the only system that combines the best qualities of a DBMS with an ability to find words and phrases in computerized documents. The system is in use today by thousands of people on major IBM and compatible mainframes running under OS, VS, MVS and CMS. The Infodata family of products also includes IQ/net, a DBMS-based system for the IBM 4300-series computers.

Call us today to learn about one of the hottest new ideas in DBMS. Your users will appreciate it.

(703) 578-3430

Infodata

Infodata Systems Inc.
5205 Leesburg Pike, Falls Church, Virginia 22041

© 1979 Infodata Systems Inc

If you were Sherlock Holmes, we'd be your Dr. Watson.

The unfailingly dependable Dr. Watson.

Loyal, trusty, he always managed to be there when Holmes really needed him.

Which, when you think about it, is precisely the kind of reliability you need from the company who sells you your communications equipment.

And so at Avanti, we try to act more like a partner than a supplier. Which means always being there when you need us. Anticipating the kind of products you'll have to have. And delivering the kind of service you can't get anyplace else.

Whether you're transmitting data from desk to desk, or from city to city, Avanti has the equipment to make it work.

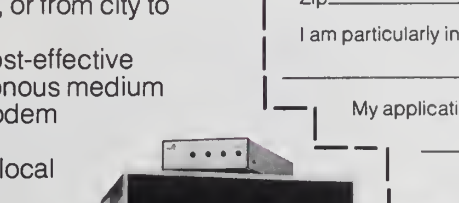
Plus the experience to help you choose the most cost-effective solution. From our full line of synchronous and asynchronous medium distance modems, line drivers, interface converters, modem sharing units, modem eliminators and more.

You don't have to be a super sleuth to detect which local data distribution company has the most to offer. It's elementary. Just write to Avanti for the facts on our full line.

Name__________
Title__________
Company__________
Address__________
City__________ State__________
Zip__________ Telephone__________
I am particularly interested in:__________
My application is:__________

AVANTI

Avanti Communications Corp., Aquidneck Industrial Park
Newport, RI 02840, Tel: (401) 849-4660, TWX: (710) 387-6543

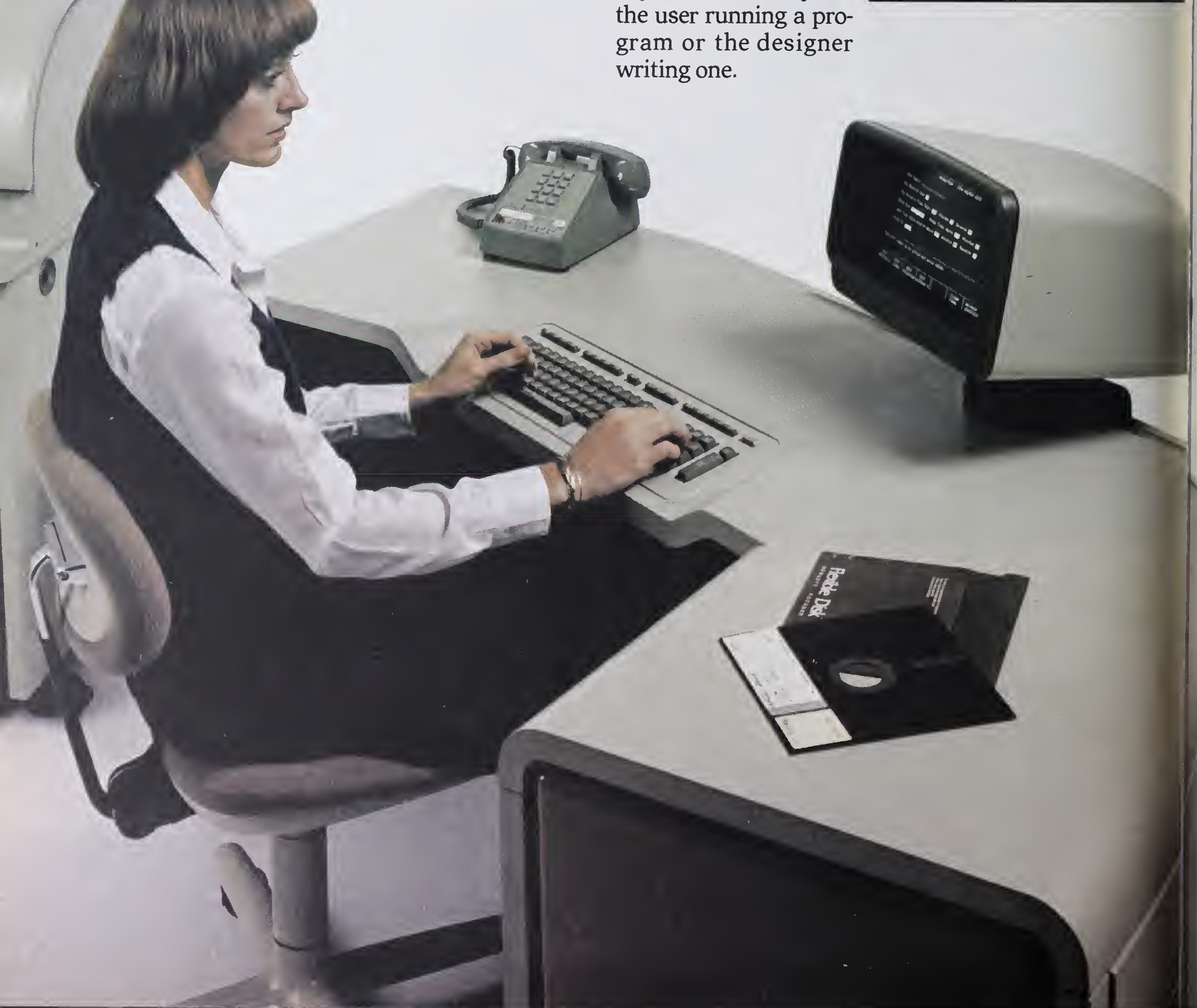


We're always here when you need us.

With the HP 250, it pays

Simplicity. That's the key to Hewlett-Packard's HP 250 small business computer. It's easy to use. And just as easy to program. A variety of HP software enhancements and programming aids help you reduce the time and effort it takes to develop applications. So you can speed up delivery times to your customers. And that can pay off in a bigger bottom line for you.

All the tools are there. IMAGE/250 (our data base management software) and its companion inquiry language QUERY/250, HP Business BASIC, FORMS/250 and REPORT WRITER/250 give you the software you need to get the most out of the system in the least time. And the HP 250's attractive, user-oriented features will make *any* operator feel right at home. The typewriter-like keyboard, adjustable video screen, and menu-driven soft keys make it easy for the user running a program or the designer writing one.



to be a business OEM.

Paying your way. Fast.

HP has designed two OEM software products with the manufacturer and distributor in mind. MFG/250 and OM/250 let you customize the system for improved inventory and fiscal management tasks—in a lot less time. So you can count a return on your investment sooner than you would have thought possible.

MFG/250 captures and maintains vital information about parts, inventory status, and cost. It automates bills of material, prioritizes stock and maintains accurate inventory records throughout the year (instead of only once or twice). So the manufacturer can get more complete control over his engineering, accounting, and materials information.

For better management of bottom line finances, HP has designed OM/250, an integrated, modular Order Management package. The Order Entry module, for instance, simplifies all types of order transactions, including multiple price breaks, exception posting, and even back orders. Other modules provide powerful capabilities for managing inventory and accounts receivable, as well as for sales analysis. There's also a special "configurator" program that helps you customize the machine even further.

Plenty of room for growth.

The HP 250 is designed to grow right along with your customer's needs. He can start small and build up, adding as many as five terminals. And with our new REMOTE/250, he can do everything at remote stations that he can do on the HP 250 itself, which may be in the next room, or across the plant. (You can use the remote terminals for programming.)

For more storage, the HP 250 can accommodate a 20 megabyte disc drive, and three printers give you a choice of hard copy options.

The HP 250 comes with full support, service, and documentation from Hewlett-Packard. With a complete system (including dual flexible disc and printer) for only $23,500, it really pays to be an HP 250 OEM. If you'd like a hands-on demonstration, give us a call at your nearest HP office listed in the White Pages. Or write for more information to Hewlett-Packard, Attn: Jerry Peterson, Dept. 361, 11000 Wolfe Road, Cupertino, CA 95014.

Price is U.S. list.

HEWLETT
PACKARD

37901 HP FC6

Cobol Eased on HP 3000

OTTAWA – Designed for use on Hewlett-Packard Co.'s HP 3000 minicomputer, the Precomp/3000 precompiler from Systemhouse Ltd. is said to encourage structured programming methods by allowing the use of pseudo code constructs in Cobol programs.

With the package in place, Cobol coding is reduced and, at the same time, manual translation errors of pseudo code to Cobol are minimized. That leads to improved programming efficiency and quality, a spokesman claimed.

Distributed by mail but supported, if the need arises, from Systemhouse branch offices across Canada and in the U.S., the precompiler costs $3,900 (Canadian) and "probably somewhat less in the States," the vendor said from 99 Bank St., Ottawa, Ont. K1P 6B9, Canada.

Burroughs-Based 'RSS' Modules Support Range of Retail Functions

JOHNSTOWN, Pa. – A comprehensive retail accounting and management information system, described as having enough flexibility to meet the needs of a wide range of retailers using small or mid-sized Burroughs Corp. hardware, has been introduced by Data Consultants, Inc.

The Retail Services System (RSS) is modular, supporting such operations as sales audit and analysis, purchases, accounts payable, accounts receivable, item (SKU) inventory, perpetual unit and dollar inventory as well as material on-order and open-to-buy stock.

Physical inventory control, merchandise plan, retail ledger, general ledger and financial reporting, payroll, fixed asset accounting and various other financial support modules are also available.

The sales audit and analysis module interfaces with most vendors' point-of-sale devices in batch mode and many of them remotely over data communications lines. The accounts payable and "on-order" modules provide for central warehousing or drop-shipping for firms having multiple locations.

Written in ANS Cobol and therefore adaptable to many environments, RSS was developed primarily for Burroughs sites with B80, B90, B800, B1800, B1900 or larger medium-scale CPUs. RSS will interact with any Burroughs software support packages such as Reporter, Odesy and Domain, Data Consultants noted.

The modules are currently available separately for 20% less than the $2,000 to $5,500 each the vendor expects to charge after the introductory period.

Data Consultants is at 1724 Lyter Drive, Johnstown, Pa. 15905.

Service Sees Energy Need

NEW YORK – McGraw Hill, Inc.'s Cost Information Systems Division is now offering an Energy Requirements Analysis service so architects know how much energy a proposed building will use even before blueprints are drawn.

Developed in conjunction with Baltimore-based Mueller Associates, Inc., the service considers a structure's intended use, size, building materials, location (by Zip Code) and other factors to determine its annual heating and cooling loads and, by extension, its energy consumption for lighting and building services.

The analysis programs are installed on McDonnell Douglas Automation (McAuto) facilities and can be accessed directly by any firm having enough demand for the support. Architects with less of a workload can submit data to McGraw Hill, whose personnel will access McAuto and get responses back to the requester within 24 hours.

While users with terminals in their offices will face costs dependent on use, McGraw Hill provides single-building analyses for $49 or, in conjunction with a more comprehensive conceptual budget analysis, for $75. More information is available from McGraw Hill, Suite 1759, 1221 Ave. of the Americas, New York, N.Y. 10020.

A Major Enhancement

Release 8 Is The New MARK IV.

Now you can choose a major new product that can dramatically reduce the cost of programming your business applications.

It's called MARK IV® Release 8. It offers major new improvements in throughput, graphics capabilities, on-line support, and multi-dimensional arrays.

(MARK IV is the most successful application implementation software product ever sold. Today it's in use at more than 1,400 computer sites in 44 countries.)

Release 8 has been configured to deliver optimal price/performance for your operating system, data base, and virtual memory needs, and DOS-level systems at attractive prices.

Enhancement By Committee.

Many of the advantages available to you in Release 8 are the direct result of the experience of actual MARK IV users: the System Evaluation Committee of the MARK IV User Group.

The number one priority of this experienced group was array processing.

So now the new array definition capability of Release 8 lets you process multi-dimensional arrays to quickly produce aging reports, cross-foot financial reports, and statistical summaries.

Enhanced Throughput.

You achieve it through major architectural changes in Release 8 software.

You get single-step processing capability. This simplifies execution procedures and reduces I/O channel activity for report sorting.

And since Release 8 uses sophisticated compilation techniques, execution speed is comparable to equivalent COBOL jobs.

Enhanced Data Display.

Graphics is another new feature of Release 8.

You can produce vertical or horizontal bar graphs. Scatter diagrams. Absolute or relative bar graphs. And recap summary reports.

All of this display flexibility can be extremely useful in graphic management reports, forecasting, and mathematical or trend analysis.

Enhanced On-Line Support.

Release 8 now makes the MARK IV data inquiry language available for CICS and INTERCOMM environments—together with several query language extensions and enhanced IMS/DC support.

And Release 8 now provides a compatible query language for use with all of these operating systems and monitors:

OS, OS/VS, DOS, DOS/VS, IMS/DC, CICS, INTERCOMM, TSO, and CMS—among others.

Enhancement Of The Mind.

MARK IV Release 8 is a new Implementation System from Informatics. It is a working tool. A system specifically designed to expand the problem-solving power of the human mind.

Discover all of the ways it can help you realize the maximum potential of your programming staff.

Just mail the coupon. Or, call (213) 887-9121.
Telex: 69-8473

Mr. Ron Mullenaux, Informatics Inc.
21050 Vanowen Street, Canoga Park,
California 91304

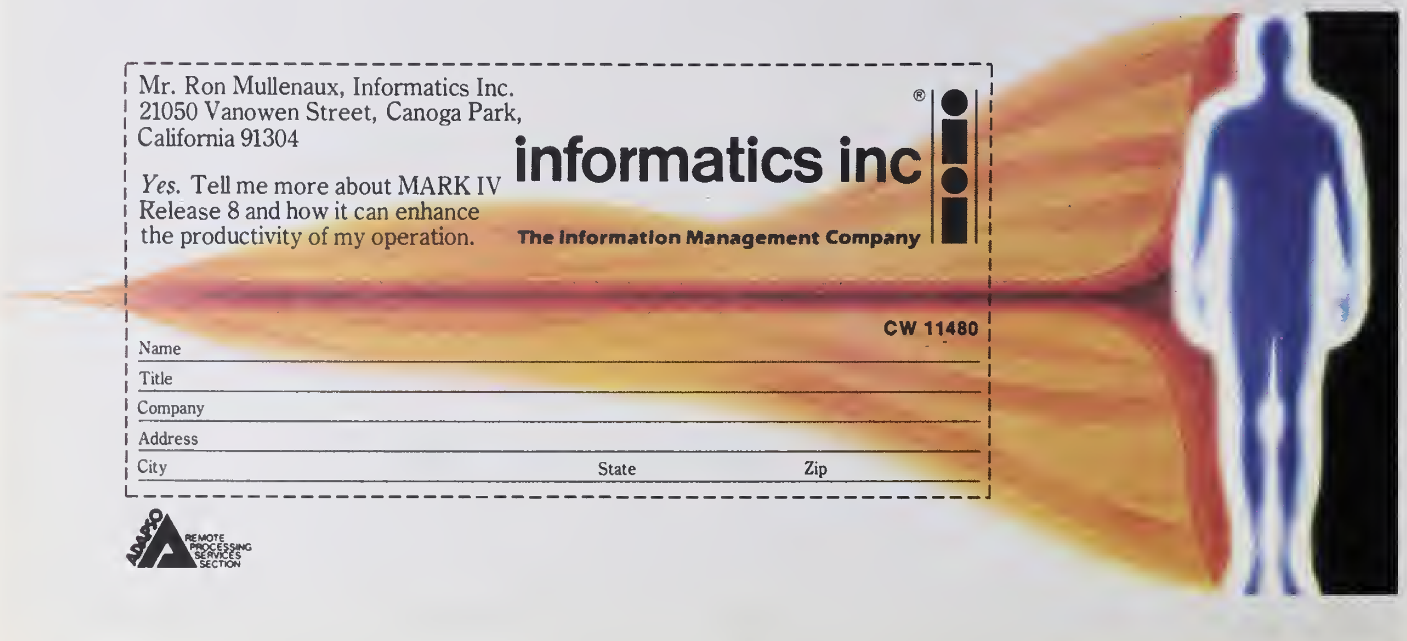
Yes. Tell me more about MARK IV Release 8 and how it can enhance the productivity of my operation.

informatics inc®
The Information Management Company

CW 11480

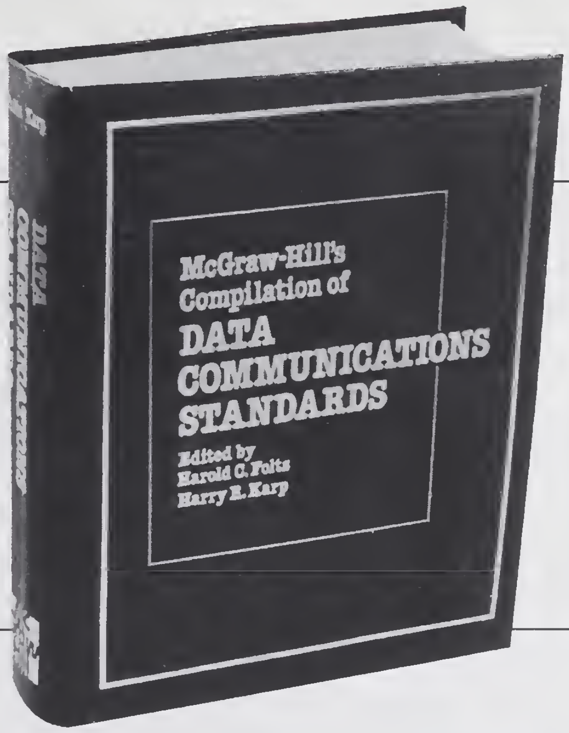
Name
Title
Company
Address
City State Zip

ADAPSO REMOTE PROCESSING SERVICES SECTION



Take any one of these five incredible sets for only

$14.95



DATA COMMUNICATIONS STANDARDS
McGraw-Hill's Compilation of
DATA COMMUNICATIONS STANDARDS
Edited by
Harold C. Folts
Harry R. Karp

1

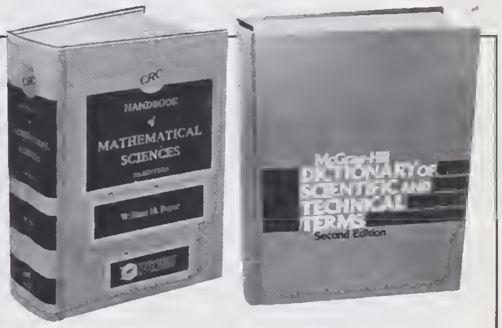
Data Communications Standards, edited by Harold C. Folts and Harry R. Karp, is that breakthrough publication everyone's been talking about. The first book of its kind, the first comprehensive compilation of the latest standards for transmission, processing systems, peripherals, signal quality, analog and digital interfaces. **DCS** gives you the 89 data communications standards advanced by CCITT, ISO, ANSI, EIA, and FTSC. 1133 pages.

Publisher's Price $165.00 (Counts as a set.) Code #450/579

AUTOMATIC DATA PROCESSING HANDBOOK
Encyclopedia of Professional Management

2

Automatic Data Processing Handbook edited by The Diebold Group. 976 pages, 269 illustrations.
Encyclopedia of Professional Management edited by Lester R. Bittel.
Combined Publisher's Price $68.45.
Code #789/304



CRC
HANDBOOK of MATHEMATICAL SCIENCES
William H. Beyer
McGraw-Hill DICTIONARY OF SCIENTIFIC AND TECHNICAL TERMS
Second Edition

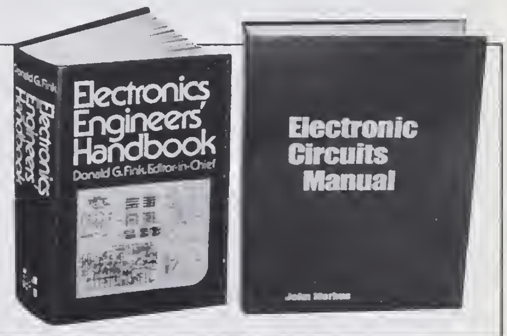
3

CRC Handbook of Mathematical Sciences edited by William H. Beyer.
Dictionary of Scientific and Technical Terms edited by Daniel Lapedes. 1,800 pages, 3,000 illustrations.
Combined Publisher's Price $89.45.
Code #789/339

ENCYCLOPEDIA OF COMPUTER SCIENCE
MICROPROCESSOR APPLICATIONS MANUAL

4

Encyclopedia of Computer Science edited by Anthony Ralston and Chester L. Meek.
Microprocessor Applications Manual by Motorola Semiconductor Products, Inc. 720 pages, illustrated.
Combined Publisher's Price $98.00.
Code #789/312



Electronics Engineers' Handbook
Donald G. Fink, Editor-in-Chief
Electronic Circuits Manual
John Markus

5

Electronics Engineers' Handbook edited by Donald G. Fink.
Electronic Circuit Manual by John Markus. 988 pages.
Combined Publisher's Price $94.00.
Code #789/320

Join the
Computer Professionals' Book Club
now—and save up to $150 on professional books you thought only libraries could afford!

Now these fundamental reference books can be yours for only a fraction of their cost! Take your choice of these sets—worth as much as $165—for only $14.95 when you join the Club.

These high quality publishers' editions are just a token of the opportunities the Club provides to help you build your professional library. As a Club member you'll watch your savings add up fast on the latest and best publications in the field—books on programming techniques, computer architecture, languages, distributed systems, data communications, and other vital areas you won't find covered in your local bookstore.

Why YOU should join now!

- **Best Books In Your Field**—Books are selected from a wide range of publishers by expert editors and consultants to give you continuing access to the latest books in your field.
- **Big Savings**—Build your library and save money, too! We guarantee savings of at least 15% off publishers' list prices on every book. Usually 20%, 25%, or even higher!
- **New! Bonus Books**—You'll immediately begin to participate in our Bonus Book Plan that saves you 70-80% off the publisher's price of many books.
- **Convenience**—Fourteen times a year you'll receive the Club Bulletin FREE, fully describing the Main Selection and alternate selections, together with a dated reply card. If you want an alternate selection—or no book at all—you simply indicate it on the regular reply card and return it by the date specified. You will have at least 10 days to decide. If, because of late mail delivery of the Bulletin, you should receive a book you do not want, just return it at the Club's expense.

As a Club member, you agree only to the purchase of four books over a two-year period.

Computer Professionals' Book Club
P.O. Box 582, Hightstown, New Jersey 08520

Please enroll me as a member and send me the set indicated, billing me for only $14.95, plus local tax, postage, and handling. If not satisfied, I may return the set within 10 days and my membership will be canceled. I agree to purchase a minimum of four books during the next two years as outlined under the Club plan described in this ad. Membership in the Club is continuous but cancelable by me any time after the four-book purchase requirement has been fulfilled.

Write Code # of set you want here

Orders from outside the U.S. must be prepaid with international money orders in U.S. dollars.

Charge my ☐ VISA ☐ MASTER CHARGE* Exp. Date

Credit Card # *MC Bank #

Signature

Name

Address

City, State, Zip

Corporate Affiliation

This order subject to acceptance by McGraw-Hill. All prices subject to change without notice. Offer good only to new members. A postage and handling charge is added to all shipments.

P39437

Update Boosts 'Datamanager' Ties to DBMS

LEXINGTON, Mass. — Release 2.1.2 of the Datamanager data dictionary system from MSP, Inc. is said to include more direct support for data base management system (DBMS) users and "radically increased" flexibility and ease of use.

For the users of IBM's IMS, Datamanager now fully supports secondary indexing. It also provides Program Control Block (PCB) member definition support including field-level sensitivity.

A feature IBM added to IMS/VS Release 1.5, field-level sensitivity provides a mechanism to limit access to a subset of the fields in an IMS/VS DL/1 data base segment.

The MSP software can be used under IMS/DC if on-line operations are desired, according to a spokesman.

With the latest Datamanager release, installations using either IMS or Software AG's Adabas can define accesses to their data base through a PROCESSES clause that identifies the DBMS being used. In time, this facility will be extended to other data base packages, the spokesman added. Meanwhile, users of Cincom Systems, Inc.'s Total 8 are also provided full support for the enhancements built into that DBMS, he noted.

Among the features added to Datamanager to simplify its use are a user-defined syntax facility, a keyword-in-context (Kwic) search facility, full editing capability on updating commands and a facility for the interception of Datamanager input lines for verification by user-coded routines.

The user-defined syntax facility allows the user to add as many as 1,500 installation-specific entity types to the data dictionary structure and to specify and then enforce the entity-to-entity relationships.

Release 2.1.2 of Datamanager costs OS/VS installations $13,500. DOS/-VS shops can acquire the software for $8,150. More than 20 separately priced options — "selectable units" — are available for $3,000 each (for OS sites) or $1,800 each (for DOS users), MSP's spokesman said from 21 Worthen Road, Lexington, Mass. 02173.

DOS/VS (E) and CICS/VS

- Systems Implementation Consulting
- Contract Systems Programming
- Program Products
  - BIMSPOOL—POWER/VS to CICS/VS Terminal Printer Spooling System
  - BIMSUBMT—On-Line Job Submission
  - BIMDSLOG—Console Message Redisplay

B I MOYLE ASSOCIATES

BIM
4355 Lyndale Ave. S.
Minneapolis, MN 55409
612-822-2661

Member Independent Computer Consultants Assn

HP 3000

PACKAGE SYSTEMS

- **SUCCESS-PROVEN PACKAGES** installed and supported by their developers, Hewlett-Packard and Data Systems for Industry.
- **FIXED PRICE AND SCHEDULE** with hardware-software discounts and leasing available to qualified customers
- **INTERNATIONAL SUPPORT FROM OFFICES IN —**
  Geneva, Paris, Madrid, Lyon, Milan, London, Brussels, Long Beach

ACCOUNTING
- Payroll, Personnel
- Labor Distribution
- Accounts Receivable
- Accounts Payable
- Fixed Assets
- General Ledger

MANUFACTURING
- Order Entry
- Bill of Material Processing
- Inventory & Order Status
- Material Requirements Planning
- Shop Floor Control
- Capacity Reporting

DISCOUNTS
- Hardware and Software discounts on single-site installations
- Unlimited usage software agreements on multiple-site hardware sales

LEASING
- Qualified customers can get up to 7 years, as low as 7.5% per annum.
- Hardware only or package hardware-software leasing.

DATA SYSTEMS FOR INDUSTRY
3450 E. Spring Street, Long Beach, CA 90806
(213) 595-5601
A Subsidiary of IEI, SA Geneva, Switzerland

'TED' Backs Text Editing At DEC Sites With RSTS/E

N. MIAMI, Fla. — If you tell anyone from Florida Computer, Inc. you want TED in '80, you'll wind up owning a text editing system before the year is out.

TED is the name of Florida Computer's latest release designed for the Digital Equipment Corp. RSTS/E operating system. The system will reportedly create and edit text and other files using English language commands which, the vendor claimed, can be learned by just about anyone.

The editor can duplicate or reposition text and offers a variety of search capabilities. Primarily a line-oriented editor, TED can also provide some character-oriented editing features, according to a spokesman.

Other Aspects

In addition, the system will examine and edit nonprinting characters; examine and edit by column position; insert text from any system text file into the file currently being edited; and search for the first or nth match, the vendor said.

Users can customize the editor for specific tasks. Those custom changes can be varied from session to session, the vendor said.

TED is available in the Basic-Plus or Basic-Plus-2 programming languages. A combined tutorial/reference manual is available in a printed version on magnetic tape.

TED costs $2,500, the vendor said from 99 N.W. 183 St., N. Miami, Fla. 33169.

Cobol Programs Eased by 'Xbol'

ADVANCE, N.C. — A Cobol precompiler for IBM 370 or compatible CPUs running in VS environments is available from David Eargle Software Products, Inc. and reportedly can cut coding, testing and debugging operations overall by at least 75%.

Called Xbol, the package enables users to work with "structured" verbs such as DO, DO . . . WHILE, DO . . . UNTIL and END DO. It also generates matching and control-break logic, has a complete report writer and produces a standardized program format, according to a spokesman.

The precompiler provides a series of macroinstructions and a macro processor which allows users to define verbs to meet their own special needs. The software also has a conditional assembly processor enabling different versions of a program to be created from a single-source library.

Xbol allows attribute — file or date name — substitution and generic device assignments. Running under DOS/VS or OS/VS with CICS/VS, it uses a 200K-byte virtual partition. It costs $400/mo, the vendor added from 122 Creekwood Drive, Advance, N.C. 27006.

Systems Running UCSD Pascal Get WP Tools

SAN DIEGO — Two layers of word processing (WP) support are available for the UCSD Pascal operating system environment from Renaissance Systems, Inc. One package formats and prints text files; the second aids the user in document generation.

The first package, Proff, is said to have a full line of features including adjustable margins; filling, centering and adjusting; automatic page numbering; text underscoring; and printing. An INCLUDE command allows reading from files other than the original input file, a spokesman noted.

Proff supports interactive debugging during execution, he added.

Second Package

Forml, the second package, requires a Proff source file to perform textual substitution, after which it calls Proff to produce the modified copy of the document. Multiple copies of a form letter, each addresssing a different person, can be produced with this facility, the spokesman said.

Since both Proff and Forml are written in UCSD Pascal, they can be used on any machine running the UCSD operating system. The packages currently support output going to a Diablo Hytype II WP-oriented printer, the system console, a line printer or a disk file.

The packages are distributed in machine-readable form on 8-in. soft-sectored, single- or double-density floppy disks. Proff by itself costs $425 while the Proff/Forml combination costs $500.

Documentation is available separately for evaluation; its cost ($25) is credited toward the price of the software if it is purchased, Renaissance said from Suite M, 11760 Sorrento Valley Road, San Diego, Calif. 92121.

PANAUDIT
FREES UP
VALUABLE
AUDITOR
TIME

Foremost among the many demands placed on auditors and financial executives today is the need for expediency—audit deadlines must be met. And the methods of yesteryear just aren't equal to the task. Now, from Pansophic, comes the answer to timely completion of audits. It's called PANAUDIT, the new systems approach to computer auditing.

PANAUDIT, designed by an auditor, can solve your many computer auditing needs. Over 50 audit modules are provided as tools to do as complex an audit as your environment dictates. Some examples of these state of the art routines are: SMF ANALYSIS which provides access to system generated audit trails based upon auditor determined criteria; SYSTEM RANKING provides a consistent, rational and demonstrable methodology for prioratization of systems to be audited; DISTRIBUTION ANALYSIS can be used to identify unusual activity of quantitative versus quantitative, quantitative versus nonquantitative, and nonquantitative versus nonquantitative fields; and DATA SET COMPARISON provides the auditor with an automated regression test capability. Additionally, it can be used to identify unauthorized changes in programs by comparison to an audit copy.

PANAUDIT makes it possible to audit "through" the computer by retrieving information to your specifications without relying on data processing personnel. Combine this independence with ease of use—made possible by the Audit Command System and the Audit Data Dictionary—and you have a flexible audit system with which to produce your own reports without becoming a technician.

For more detailed information contact Pansophic, the people who bring quality systems software to a worldwide user base.

PANSOPHIC
709 Enterprise Drive • Oak Brook, IL 60521
800-323-7335

Information Hard to Get

Users Still Harassed by Stubborn DP Attitudes

By Stephen L. Robinson
Special to CW

Data Base Corner

Readers of this column know one of my favorite topics is the difference between a data base system philosophy and the use of a data base management package.

The success of the packages is well documented. The software houses that market the major data base packages are doing rather well. Sales are up and all are expanding in teleprocessing packages, data dictionaries, report writers and query languages — if they didn't already have such facilities.

Documentation on successful implementation of the data base philosophy, however, is hard to come by. Data base packages are, for the most part, still being used to rebuild stand-alone, file-oriented, second-generation, tape- or card-structured systems. It's nice to dream that the '80s will see an end to such shortsightedness, but in reality, the DP community seems intent on using new hardware and software to rebuild old systems.

The significance of this situation was brought home to me — literally — when my sister and her husband visited recently. She is an accounts receivable officer at a major manufacturing company headquartered in New York, and in the three months she'd been there, she'd been frustrated by a lack of information — information that had been available to her in her previous place of employment.

"Why can't I get a history, by company, of payments received going back for the past year?" she asked. "Now I've got to look up a company's record on 12 separate monthly printouts to get the complete picture." That, she added, was a not inconsiderable task, given the size of each month's printout.

Why not, indeed? Her request for the comprehensive report sifted up through the ranks. "Great idea," everyone agreed.

Then the query reached the DP department. "It'll take at least a year or so to get that report," they said. Any simple report that takes a year to produce will never be produced, as DPers — and a growing number of end users — know.

Case of Entrenchment

Clearly the one-year time frame was formulated to discourage interest in the report. The DP department, firmly entrenched in its manner of storing and retrieving data, was not about to try reorganizing *its* data just because the business side of the company (Who are they anyway? What do they know about JCL?) needed some information.

And so, we see another example of data processing dictating the logic of business systems, rather than the other way around. What is particularly strange in this and other similar situations is the failure of corporate top management to become involved in the problem, or even — apparently — to be aware there is a problem.

True, DP costs typically represent a very small percentage of the cost of the corporate product. That is, however, the smallest part of the cost of ineffective data and information systems. Corporate personnel, at all levels, make decisions based largely on information provided by the DP department. Those decisions affect not only the profitability but perhaps the very existence of the company.

In the case of my sister's company, credit may be extended to customers who would not otherwise get extended payment schedules. The result, if enough poor risks were carried and then failed to meet their obligations, could be a substantial bath in red ink for the manufacturer.

It would not be the first time such a situation arose, nor would it be the last. But the possibility could be sharply reduced if the DP staff recognized its full responsibility and found a way to make the *company's* information available to those who need it when they need it.

Robinson is an independent consultant, operating as S.L. Robinson & Associates, in Morrisville, Pa.

Copyright 1980, Stephen L. Robinson

On Another Subject

There have been several recent well-publicized instances of air traffic control systems, including computers, failing with possible life-threatening consequences.

Quite apart from my general concern for the people involved, I am disturbed to see such incidents branded as computer failures. Computers do fail, sometimes for an instant, sometimes for prolonged periods. But that's not the point.

The real failure is in the inability of the systems that use the computers to react to the outage. Why is a flight controller system designed without adequate electronic backup? Why are there no standard manual procedures that are initiated as soon as electronic problems become critical?

Let's stop blaming the computer: the problem is in our systems. The sooner we design systems better, the sooner we can stop experiencing such near catastrophies.

— Steve Robinson

'Trac' Shows CICS Costs

CHERRY HILL, N.J. — An on-line monitoring system for DOS/VS or OS/VS versions of CICS is available from Value Computing, Inc.

Called Trac-CICS, the transaction accounting and chargeback package reportedly contains a data capture facility that uses less CPU overhead than IBM's performance analyzer.

Trac-CICS can also interface with IBM's performance analyzer.

Trac-CICS costs $3,000 for DOS/VS sites and $4,500 for those with OS/VS, the vendor said from 300 VCI Building, W. Marlton Pike, Cherry Hill, N.J. 08002.

"Savings Abound the Second Time Around"

Why wait up to twelve weeks for new equipment when you can save time and money by taking **immediate delivery** on **Interdata** systems, modules and peripherals, **Calcomp** plotters and controllers, **Calma** interactive design systems and

- **TEKTRONIX** 4012 Displays
- **TEKTRONIX** 4631 Hardcopy Units
- **TEKTRONIX** 4632 Hardcopy Units

romelan industries inc.

502A Van Dell Way • Campbell • CA 95008
(408) 379-9120

STOCK CONTINUOUS CHECKS & STATEMENTS

You can take advantage of the most complete line of stock, off the shelf continuous checks available, with more formats added monthly. We have an economical check that will meet your needs. *Low Minimum Order *Fast Delivery

DEC* OEM's

Now your customers can order as few as 500 checks, specifically designed for DIBS* Software formats.

SEND FOR YOUR FREE SAMPLES TODAY!

FREIGHT INCLUDED

Are you designing a Software package?

If you pick a format from our extensive forms library, your users and dealers, will have a reliable, economical source for their forms. Call us for more information.

Checks To-Go

NATIONWIDE SERVICE

*TRADEMARKS OF DIGITAL EQUIPMENT CORPORATION

Dealers Inquiries Welcome

P.O. Box 148, Spring Valley, California 92077 (714) 460-4975

ACCELEWRITER™
DOUBLES DECWRITER™ SPEED

Double the speed of your LA36 Decwriter from 30 to 60 CPS. The ACCELEWRITER is a small molded module which plugs into the printer's logic board and enables the Decwriter to print at its "catch-up" speed of 60 CPS all of the time.

Wait only half the time for your Decwriter to finish its printing job. Easy installation and easy reconversion, if ever desired. Full year warranty. Only $115.00. Available NOW from:

LARKS ELECTRONICS & DATA
P.O. Box 22 Skokie, Illinois 60077 (312) 677-6080

TERMINALS
FROM TRANSNET

PURCHASE FULL OWNERSHIP AND LEASE PLANS

DESCRIPTION	PURCHASE PRICE	PER MONTH 12 MOS.	24 MOS.	36 MOS.
LA36 DECwriter II	$1,695	$162	$ 90	$ 61
LA34 DECwriter IV	1,295	124	69	47
LA120 DECwriter III KSR	2,295	220	122	83
VT100 CRT DECscope	1,895	182	101	68
VT132 CRT DECscope	2,295	220	122	83
DT80/1 DATAMEDIA CRT	1,895	182	101	68
TI745 Portable Terminal	1,595	153	85	57
TI765 Bubble Memory Terminal	2,795	268	149	101
TI810 RO Printer	1,895	182	101	68
TI820 KSR Printer	2,195	210	117	79
TI825 KSR Printer	1,695	162	90	61
ADM3A CRT Terminal	875	84	47	32
QUME Letter Quality KSR	3,195	306	170	115
QUME Letter Quality RO	2,795	268	149	101
HAZELTINE 1410 CRT	875	84	47	32
HAZELTINE 1500 CRT	1,195	115	64	43
HAZELTINE 1552 CRT	1,295	124	69	47
DataProducts 2230 Printer	7,900	757	421	284
DATAMATE Mini Floppy	1,750	168	93	63

FULL OWNERSHIP AFTER 12 OR 24 MONTHS
10% PURCHASE OPTION AFTER 36 MONTHS

ACCESSORIES AND PERIPHERAL EQUIPMENT
ACOUSTIC COUPLERS • MODEMS • THERMAL PAPER
RIBBONS • INTERFACE MODULES • FLOPPY DISK UNITS
PROMPT DELIVERY • EFFICIENT SERVICE

TRANSNET CORPORATION
1945 ROUTE 22, UNION, N.J. 07083
201-688-7800
TWX 710-985-5485

MSM solves the problems of sharing TAPE and DISK devices in a multiple systems environment.

MSM™
The Multiple Systems Manager™

- MSM, the Multiple Systems Manager, automatically controls the inter-system usage of your TAPE and MOUNTABLE DISK devices.
- MSM allows TAPE and MOUNTABLE DISK devices to be ONLINE to all systems. There is no longer any need to "shuffle" devices among your systems in an attempt to satisfy shifting workload demands.
- MSM increases operator productivity by relieving them of the tedious "bookkeeping" chore of monitoring and adjusting which systems use each device.
- MSM increases system productivity—devices can now be used by any of the systems as needed—they can be allocated at computer speed rather than human-decision speed.
- MSM makes it impossible for different jobs in different systems to simultaneously use the **same** TAPE device. This saves costly job re-runs and, perhaps more importantly, enhances the integrity of your tape data.
- By managing devices more efficiently, MSM may allow you to actually reduce the number of TAPE and MOUNTABLE DISK units you require—or to defer upcoming requirements.
- MSM allows an installation to hierarchically organize devices into "preference groups". MSM insures that devices of higher preference are used before devices of lesser preference. If desired, different systems can have different preference groupings. The flexibility of preference grouping allows a number of interesting options to be considered, including:
  - Faster devices to be used before slower devices.
  - Devices clustered near a particular system to be used by jobs in that system in preference to devices located further away.
  - Use of non-shared devices in preference to SHARED devices.

SUPER-MSI™
Multiple Systems Integrity Facility™

Also consider Super-MSI, the Multiple Systems Integrity Facility . . .

Super-MSI:

- Protects your Shared DASD data by **assuring** cross-system integrity.
- Eliminates RESERVE lockouts thereby improving performance, enhancing realtime (eg., TSO response) and eliminating costly unscheduled IPLs.
- Provides pertinent information to your operators and TSO users about dataset conflicts as they occur—this enables them to be expediently resolved.
- Improves throughput by allowing work to be balanced more evenly across your systems (since integrity is now **guaranteed**).
- Because your data integrity is very critical, Super-MSI is designed with great reliability—for example: it will provide continuous airtight protection even if its own communication tables suffer multiple devices failures.

These products use only an insignificant amount of overhead.

Over 240 SHARED DASD and SHARED TAPE installations are already using these products to **protect their data** and improve the efficiency of their systems. Super-MSI and MSM have logged an aggregate of **several million hours** of execution time in production systems like your own.

We invite you to try either or both of these products at your own installation. This trial carries no charge and is without obligation. Convince yourself.

To arrange a free trial, or to discuss any questions or concerns you may have, simply give us a call toll-free at **800-543-7583 ext. 203** (except from Ohio where you should call collect at **813-774-3077**). Or write:
Software Department-Allen Services Corporation-212 West National Road-Vandalia, Ohio 45377

ALLEN SERVICES
CORPORATION®

Your data is your most valuable asset
—Protect it with SUPER-MSI and MSM

DBMS Gives City Better Approach to Programs

By James A. McCann
Special to CW

With the need for continuous, careful monitoring of an increasing range of municipal programs, it became clear in the 1970s that the City of Milwaukee needed to expand its data management capabilities.

To meet this need, a Housing and Urban Development (HUD) grant was used to implement a Financial Management Information System (FMIS) in the Comptroller's Office and a Policy Development Information System (PDIS) in the Central Electronic Data Services (Ceds) Department.

Both projects are under the guidance of the Policy Management Information Systems Steering Committee, a group of top city decision makers and major departmental users.

Specific functions include but are not limited to on-line appropriation accounting control, inventory control, equipment control, payroll edit and control and access to varied planning data of all properties in the city.

An integral part of FMIS and PDIS is the Adabas data base management system (DBMS) purchased from Software AG and now housed in the Ceds Department.

The center operates a 768K-byte IBM 370/145 and a 1M-byte Itel Corp. AS/4 mainframe, both functioning under DOS/VS Version 34. The DBMS can be called by 54 terminals throughout the city, all controlled by IBM's CICS.

The city constructed its systems by the building block method. New files are added to the integrated data base according to the priorities established by the Ceds Board, taking into consideration departmental needs.

Top priority was given to the financial management function, with Comptroller's Office, FMIS Project and Ceds personnel responsible for design and implementation. A Transaction Detail Accounting File receives all city accounting on-line transactions from terminals and summarized off-line updates from the periodic batch runs of several other data entry and processing modules. They process payroll/labor charges and cost distribution, inventory usage, central equipment usage, stores billing, budget preparation and cash receipts and disbursements.

This portion of the system produces all accounting reports required to meet the standards of the National Council of Governmental Accounting, as well as a range of other information.

At approximately the same time the Transaction Detail Accounting File was being implemented, another key element of the data base, the Master Property File, was being developed. This component of the DBMS is a geographical file of all properties, land use and structures in the city. It was developed primarily from city data recorded by the Tax Commissioner's Office and consolidated by the PDIS Section of Ceds into a planning file for use by the Department of City Development.

The Master Property File portion of the DBMS is vital in such areas as urban planning, economic impact analysis and property value analysis for tax purposes.

Two other major components have been implemented to serve the Labor Negotiator's Office.

While it is difficult to quantify benefits, it is apparent that the more timely and flexible retrieval capabilities of the DBMS will be of significant value to the city in its contract negotiations with 19 municipal employee unions.

Financial Files

Just recently implemented, a general ledger file receives updated information concerning the city's general accounts and complements the Transaction Detail Accounting File and provides the necessary information for interim financial statements. Another file will be created for the Purchasing Department covering all inventory transactions. This reference file can be used as an audit trail for one-time unique data retrievals.

In the Department of Building Inspection, two files will be created to geographically track housing code violations. This application will replace the current manual system and allow tighter management control and improved audit trail.

Two files being developed for the Personnel Department will contain individual personnel and employee history data. These files will also replace a manual system and allow more efficient and effective retrieval of necessary information, yet still incorporate all necessary legal safeguards concerning data privacy and security.

Fuel Use Tracking

A Fuel Consumption File presently being put together for the Bureau of Municipal Equipment will store data captured by the city's automated fuel dispensing system to permit Municipal Equipment personnel to monitor fuel use, efficiency, frequency of repair and related concerns.

DBMS implementation in the City of Milwaukee is not guided by pure management information system theory. Rather, development is geared to the priority of departmental needs. Future work will entail integration of data from various Adabas files. However, it is certain that some files will remain "stand-alone."

McCann, a certified public accountant, is comptroller for the City of Milwaukee and chairman of the Policy Management Information System Steering Committee.

IN THE MAIL!

FIRST AGAIN . . . THIS TIME WITH DOS/VSE JOB ACCOUNTING.

Hundreds of the best-run DOS data processing centers around are first again. They are receiving Johnson Systems' enhanced Job Accounting Report System (JARS) that includes support for DOS/VSE! That means they can make substantial savings in run time, CPU, and elapsed time in their VSE environment. Costs will drop immediately, without having to wait.

Also included in the many improvements:
- New 43XX Hardware Support
- RJE Line Utilization Reporting
- Comprehensive Forms Billing

Only Johnson Systems maintains support for all OS and DOS releases ... and now with DOS/VSE ... we're first again.

Johnson Systems, inc.

Mark Stall • Johnson Systems, Inc. • 7923 Jones Branch Drive • McLean, Virginia 22102 • USA • Phone: 703 821-1700 • Telex: 89-9100
David Asdarian • Johnson Systems (UK) • 10 Station Road • Watford, WD1 1EG Hertfordshire • England • Phone: 0923-46255
Johnson Systems GmbH • Hunsrueckenstrasse 22 • 4000 Duesseldorf • West Germany • Phone: 0211/32 09 95 • Telex: 841-858-2177

Also, please send me information about these other Johnson Systems products:

☐ OS JARS—JOB ACCOUNTING REPORT SYSTEM—a computer utilization and job accounting package that provides performance measurement and comprehensive computer accounting and cost distribution for OS/MVS, SVS, VS1, MVT, MFT users.

☐ UMAX—CICS/VS UTILIZATION MONITOR AND CHARGEBACK SYSTEM—enables the DP Manager to account accurately and bill equitably for all resources used by each CICS/VS application and user.

☐ APEX—AUTOMATED PLANNING AND EXECUTION CONTROL SYSTEM—solves the problems of workload management by automating the Production Control of OS/MVS, SVS, VS1 Data Centers.

I would like to learn more about Johnson Systems' DOS JARS—JOB ACCOUNTING REPORT SYSTEM.

Name ____________
Title ____________ Tel. ______ ____________
Company ____________
Address ____________
City ____________ St. ______ Zip ______
CPU ______ Op. Sys. ______ TP Sys. ______
WOOL

Data Briefs

Modem Mixes Four Data Sources

SILVER SPRING, Md. — A Bell-compatible modem able to multiplex inputs from up to four synchronous data sources into a composite 9,600 bit/sec stream is available from Rixon, Inc.

The vendor's T209A modem transmits and receives synchronous serial binary data in half- or full-duplex modes over a four-wire private line.

The modem costs $6,300 from the Sangamo Weston subsidiary at 2120 Industrial Pkwy., Silver Spring, Md. 20904.

Remote Printer Debuts

ORLANDO, Fla. — A remote line printer with built-in control for microprogramming is available from Transaction Data Systems, Inc.

The remote printing system (RPS) operates as either a multidrop or dial-in impact terminal under such protocols as IBM's 2780/3780 Bisynch and 3270 Synchronous Data Link Control; Burroughs Corp.'s Select and Fast-Select; and NCR Corp.'s scheme.

With one protocol, the RPS-301 delivers 2,400 bit/sec operation for $15,000. The dual-printer RPS-302 costs $25,000 and runs at 4,800 bit/sec.

The vendor is at 5750 Major Blvd., Orlando, Fla. 32805.

Thermal Printer Offered

MANSFIELD, Mass. — A small alphanumeric thermal printer from Datel Intersil, Inc. requires only two wires to interface to a computer serial port.

Designed for panel mounting, the Serial APP-20A2 is a 20-col printer that can be located "hundreds of feet" from a computer over serial 20mA current loop lines connected to its standard RS-232C connector.

Cost is $880 from the vendor at 11 Cabot Road, Mansfield, Mass. 02048.

Replaces Acoustic Coupler

'Pocket' Modem on its Way

By Jay Woodruff
CW Staff

DENVER — A modem that reportedly eliminates the need for an acoustic coupler and has the reliability of a direct-connect modem will be introduced in February by American Teledata Corp.

No larger than a hand-held calculator, the firm's "pocket" modem was designed primarily to replace the acoustic coupler, according to its designer, Bud Henriksen. It will reportedly include all the features of acoustic modems, but will pass data with the higher reliability of direct-connect modems.

To connect the pocket modem, the user unplugs the handset of any standard FCC-registered telephone and plugs it into the modem. The modem itself plugs into the base of the phone.

The system can be used in all modem applications except auto-answer, because it does not interface directly into the phone line. But, like an acoustic coupler, it requires no FCC certification, according to Henriksen.

Circuitry consists of a Motorola Semiconductor Products, Inc. 6860 integrated circuit, with an American Teledata-designed filter, timing circuit and other support circuitry. The resulting hybrid, built by Cermetek Microelectronics Corp. of Sunnyvale, Calif., is "essentially a two-chip modem with a crystal," the designer indicated.

The interface is unique enough in the minds of its designers to deserve a patent application. They argue that because the interface is at the handset level, the system is patentable. "While the size of the modem is unique, the interface capability allows us to

(Continued on Page 62)

Machinery Maker Oils Parts Order Process

By a CW Staff Writer

COLDWATER, Ohio — For a farmer, an equipment breakdown during a harvest constitutes an emergency. A farm machinery maker here has improved its ability to get needed parts to farmers by using a remote data entry system.

Avco New Idea Farm Equipment has a parts business that represents several million dollars of its overall income. The 80-year-old firm indicated that its ability to sell about 50,000 pieces of harvest machinery hinges on how well it can fill parts orders for machinery already in the field.

Now, parts can often be delivered to farmers the day of the breakdown, according to Jim Kinzer, Avco's manager of parts operations.

Avco's five regional offices and warehouses serve more than 1,000 dealers throughout the Midwest, Canada and Pennsylvania. More than 35,000 parts are stocked, monitored and sold using systems from Northern Telecom Systems Corp. Each office is equipped with Northern Telecom's 440 system, consisting of an intelligent CRT terminal with 64K bytes of memory, a 60 char./sec printer and 5M bytes of disk storage.

The offices are linked over

(Continued on Page 62)

IEEE to Plan Local Net Standards

BEAVERTON, Ore. — The development of standards for local data communications networks is planned by the Institute of Electrical and Electronics Engineers' Computer Society (IEEE/CS).

"The object is to bring order to the now chaotic situation in localized data communications by defining standard interfaces and protocols," according to Maris Graube, chairman of the IEEE/CS local network standards committee.

Local networks allow the interconnection of digital devices such as computer systems and peripherals within an office building, laboratory or warehouse, Graube explained. Typically, data is sent serially on a single cable over a distance of up to 2 kilometers at speeds on the order of 1M bit/sec. Several hundred devices can share the same cable in such arrangements, he added.

"While many local networks exist today, there is no compatibility between them, nor between devices of different manufacturers that interface to the network," Graube said. "This lack of compatibility results in each network being a custom hardware and software implementation.

"The goal of the standardization effort is to promote compatibility so devices of different manufacturers can be easily interconnected into a system."

Committee participation is open to all interested individuals. The first meeting will be held on Feb. 29 — March 1 at the Jack Tarr Hotel in San Francisco following IEEE's semiannual Compcon conference at the same location.

More information is available from Graube at Tektronix, Inc., P.O. Box 500, MS/188, Beaverton, Ore. 97077.

WE'RE SO EXCITED
WE'RE BESIDE OURSELVES

TELETYPE 43

We also carry the new NCC-Series 8000 Computer System
- Commercial
- Scientific
- Word Processing
- Graphics

Other Products
- Texas Instruments 745, 765, 820, 810, 733
- Vadic Modems & Couplers
- DEC LA-34, LA-120, VT-100, LA-36
- Lear Seigler ADM 3A, ADM 31 ADM 42

TTL $37.00 MTH
w/EIA $41.00 MTH

NEW VT 52's IN STOCK READY TO SHIP

with ANDERSON JACOBSON 243 $49.00

NATIONAL COMPUTER
Communications Corp.
The Greatest Name in Terminals
260 West Avenue, Stamford, CT 06904

- The Teletype Model 43 has proven to be so reliable that National Computer is taking the bold step of offering the Teletype 43 with maintenance but not charging for it.
- Purchase and equity leasing available.
- Above rates are for one-year leases. Beyond one year you may keep it or return it. If you keep it, it's month to month. Never is a renewal necessary at National Computer.
- Limit 200 units on this special program.

Call:
Boston: Joann (617) 235-7055
Fairfield Area: Nancy (203) 357-0004
New York Area: Bob (212) 354-9866
New Jersey: Rosanne (201) 455-1300
Chicago: Eileen (312) 296-0830
TOLL FREE 800-243-9006
IN CONN. 203-357-0004

Highest Salaries in Telecommunications

By Brad Schultz
CW Staff

Analysis

LAKE BLUFF, Ill. — The utilities and transportation industries paid senior communications professionals higher salaries than the eight other industry groupings analyzed in A.S. Hansen, Inc.'s recently released survey of DP salaries in the U.S. [CW, Dec. 10].

Covering the year ending June 1979, the Hansen survey indicated that the highest communications salaries are sometimes offered by users of modest size and technological sophistication. Moreover, the urban areas noted for providing the highest salary averages for all areas of DP taken together may not offer the highest communications paychecks.

Hansen contrasted the salaries of various DP job categories on an industry-by-industry basis. Ten "industries" — actually groups of industries — were represented in the survey: manufacturing of nondurable goods; manufacturing of durable goods; transportation; utilities; wholesale/retail trade; finance; "insurance/real estate"; services for profit; nonprofit services; and government.

Two other categories — "mining/-construction" and miscellaneous enterprises — were excluded from the survey's results tables because of a lack of significant data.

Hansen did the nationwide industry-by-industry analysis for each of five "city levels," which the firm said indicate "the level of salaries paid for all positions with respect to the national average." Level One cities offer the highest DP salaries, Level Two cities give the second highest remuneration and so on, through Level Five.

Level One cities include Los Angeles, San Francisco, New York, Boston, Pittsburgh and Honolulu. Level Two cities include Chicago, Washington, D.C., Detroit, Philadelphia and Milwaukee. In Level Three are Phoenix, Denver, Atlanta, Miami, St. Louis and Seattle.

Oklahoma City, Kansas City, Mo., and Buffalo, N.Y., make up Level Four. The lowest paying group of cities, Level Five, includes Little Rock, Ark., Des Moines, Iowa, and Memphis, Tenn.

At Level Three

Only Level Three respondents provided sufficient data for meaningful generalizations about all 10 industries in the Hansen study.

At that city level, utilities and transportation stood out as the two industries offering the highest salaries to telecommunications managers and senior telecommunications analyst/programmers. In the utilities industry, they earned an average of $32,700 and $28,100, respectively; in transportation, they averaged $32,300 and $27,800, respectively.

The two manufacturing categories ranked next in direct compensation to telecommunications managers and senior telecommunications analyst/programmers at Level Three. Durable goods manufacturing granted them average annual salaries of $29,000 and $25,000, respectively. Nondurable goods manufacturing offered $28,400 and $24,400 average salaries, respectively.

Then came the profit services industry, government and Hansen's "insurance/real estate" amalgamation. At Level Three, the averages for telecommunications manager and senior telecommunications analyst/programmer in profit services were $27,400 and $23,500, respectively. Government appeared competitive with respective averages of $26,600 and $22,900. The two jobs earned $26,300 and $22,600 averages in insurance/real estate.

Other industry averages are summarized in the figure at the right.

Big Users Pay More?

Are users with high hardware rental bills likely to pay more to their telecommunications personnel than users whose hardware costs less? The survey gave little reason to think so.

Hansen analysed remuneration to DPers from various "sizes" of employers within each city level. A user's size was defined according to its monthly rental of mainframe equipment.

By Hansen's terminology, a Size One installation rents hardware for less than $25,000/mo; a Size Two installation pays monthly rental in the $25,000 to $50,00 range; Size Three represents the $50,000 to $150,000 range; Size Four installations expend $150,000 to $300,000; and Size Five users pay more than $300,000/mo.

According to the survey, Level One cities — which offer the highest overall DP salaries — offer telecommunications managers and senior telecommunications analyst/programmers more money — $32,200 and $27,700, respectively — at Size Two installations than their peers at the Size Five establishments, which have the highest hardware overheads. Also within Level One, senior communications professionals generally get higher pay from Size Three users than from Size Four users.

In Level Three and Four cities — urban areas that generally give moderate salaries to DPers as a whole — Size Four users pay telecommunications managers and senior telecommunications analyst/programmers more than do Size Five users, although the latter

While you're waiting, Wang's VS could be working.

If you're waiting for an IBM System 34 or 38, you've got a lot of time on your hands. So why not take a few minutes and closely consider just what you'll be getting a year or two down the road. Most importantly, consider your options.

Options like Wang's VS virtual storage computer, for instance. Compare the Wang VS and the System 34/38. We think you'll find the VS consistently comes out on top. The VS will accept your RPG programs just like a System 3, with RPG II and CCP conversion aids available to protect your System 3 software investment. With Wang's VS, you also get interactive RPG II programming with compilations 5-10 times faster than those on the System 34. Extensive program development aids. On-line and batch operations. Telecommunications. COBOL and BASIC. A fully supported data management system. Up to 4.6 billion bytes of fixed and removable disk storage. And a data compaction feature that could cut your storage requirements by at least a third.

Best of all, Wang's VS gives you the flexibility to grow from a minimum VS configuration to a full-blown system with the power of a high-end 370, without reprogramming or major equipment swap-outs. Plus the ability to do data processing and word processing at the same Wang terminal. *All this now*, for no more than you'll pay for a System 34 or 38 next year.

If your data processing problems in the eighties won't wait for solutions, call or write for more information on the Wang VS family. Better yet, ask for a VS demonstration. We can *show* you what we've been talking about — today.

Wang Laboratories
Lowell, MA 01851
(617) 459-5000

WAIT NO LONGER.

☐ Tell me more about Wang's VS.
☐ Show me the VS in action.

Name ______
Organization ______
Address ______
City ______ State ______ Zip ______
Telephone ______

Send to: Wang Laboratories, Lowell, MA 01851
(617) 459-5000

WANG Making the world more productive.
DP107/CW1140

Coming From Utilities, Transportation Industries

U.S. SENIOR TELECOMMUNICATIONS SPECIALISTS
AVERAGE ANNUAL SALARIES
JUNE 1978 to JUNE 1979

(Top figure in each box is for telecommunications managers; bottom figure is for senior telecommunications analyst/programmer.)

		CITY LEVELS[1]					
		Level One (Pays Most)	Level Two	Level Three	Level Four	Level Five (Pays Least)	INDUSTRY RANK IN LEVEL THREE CITIES
INSTALLATION SIZE[2]	Size Two ($25,000-$50,000)	$32,200 27,700	$23,500 20,200	$25,500 21,900			
	Size Three ($50,000-$150,000)	28,900 24,900	28,300 24,300	26,800 23,000	$23,600 20,200	$22,400 19,200	
	Size Four ($150,000-$300,000)	28,200 24,300	27,400 23,500	28,900 24,800	29,400 25,200		
	Size Five ($300,000+)	30,800 26,400	29,900 25,700	28,400 24,400	28,500 24,500		
INSTALLATION TYPE[3]	Type One (Single site; one CPU; local batch)	32,000 27,500					
	Type Two (Single site; unlinked CPUs; on-line)		25,300 21,800	24,400 21,000			
	Type Three (Single site, linked CPUs; or multisite, single CPU at each site)	29,100 25,000	26,800 23,000	25,800 22,100	22,500 19,300		
	Type Four (Multisite; CPUs unlinked; structured programs)	30,800 26,500	27,400 23,500	26,600 22,900	28,100 24,200		
	Type Five (Multisite; CPUs linked; state of the art)	30,000 25,800	29,800 25,600	28,300 24,300	26,400 22,700	26,700 23,000	
INDUSTRY TYPE[4]	Manufacturing Nondurable	30,600 26,300	28,800 24,800	28,400 24,400	28,700 24,700		4
	Manufacturing Durable	29,600 25,400	28,000 24,100	29,000 25,000	26,700 23,000		3
	Transportation		31,300 26,900	32,300 27,800			2
	Utilities	34,100 29,300	33,000 28,400	32,700 28,100	33,800 29,100		1
	Wholesale/Retail Trade	31,100 26,800	28,100 24,200	25,200 21,700	22,700 19,600		8
	Finance	29,300 25,100	25,800 22,200	24,900 21,400	26,300 22,600	23,300 20,000	9
	Insurance/Real Estate	29,900 25,700	28,500 24,500	26,300 22,600	23,200 19,900		7
	Services, Profit	30,400 26,100	30,900 26,600	27,400 23,500			5
	Services, Nonprofit	30,200 26,000	26,400 22,700	23,200 20,000	24,400 21,000		10
	Government			26,600 22,900		17,400 15,000	6

Source: A.S. Hansen, Inc.

FOOTNOTES

1. Urban areas, including suburbs, ranked by level of pay to all DP specialties taken together. Not intended to indicate cost of living.
2. Monthly rental of mainframe equipment. Size One (users renting for less than $25,000/mo) is excluded because of lack of data.
3. An index of technological sophistication. Type One users trail the state of the art by years and have little, if any, data communications under way. Type Five users have the latest and most powerful hardware with substantial data communications.
4. Results on "mining/construction" and a miscellaneous category were not included in the industry-by-industry analysis because of a lack of data.

have greater investments in computer equipment.

The Hansen data hints that the direction of telecommunications salaries is not tightly pegged to the direction of overall DP salaries. By definition, the overall situation for DPers is best in terms of pay at Level One, but the survey registered higher averages for communications professionals in some geographical areas that rank rather low in rumuneration to other DP specialties.

For example, Level Three users that spend between $150,000 and $300,000 per month in mainframe equipment rental pay telecommunications managers and senior analyst/programmers average annual salaries of $28,900 and $24,800, respectively. For some reason, they earn less from users of that size in Level One and Level Two cities, according to Hansen's results.

Nevertheless, Hansen found wide gaps in the compensation given to senior communications specialists in different cities. In terms of salary, the average telecommunications manager in Los Angeles — a Level One city — earns far more than his peer in Phoenix. The Californian gets $30,200, while the manager across the Colorado River gets just $17,100.

In deriving DP salary averages, Hansen also ranked its 1,510 re-

(Continued on Page 61)

BASF helps Volkswagen do it again. And again and again.

BASF disk packs keep Volkswagen's inventory moving at peak efficiency. And one reason Volkswagen chooses BASF is that our testing and quality control standards are just as tough as Volkswagen's. We test each disk in every pack for flatness, thickness, roundness, and many more factors before we assemble the pack. And we test each individual pack on equipment like yours before it leaves our factory.

The same tough standards that maintain our disk pack quality also apply to our other media. Whether you order mag cards, floppy disks, tape, or cassettes, BASF delivers the best-performing, longest-lasting product you can buy today.

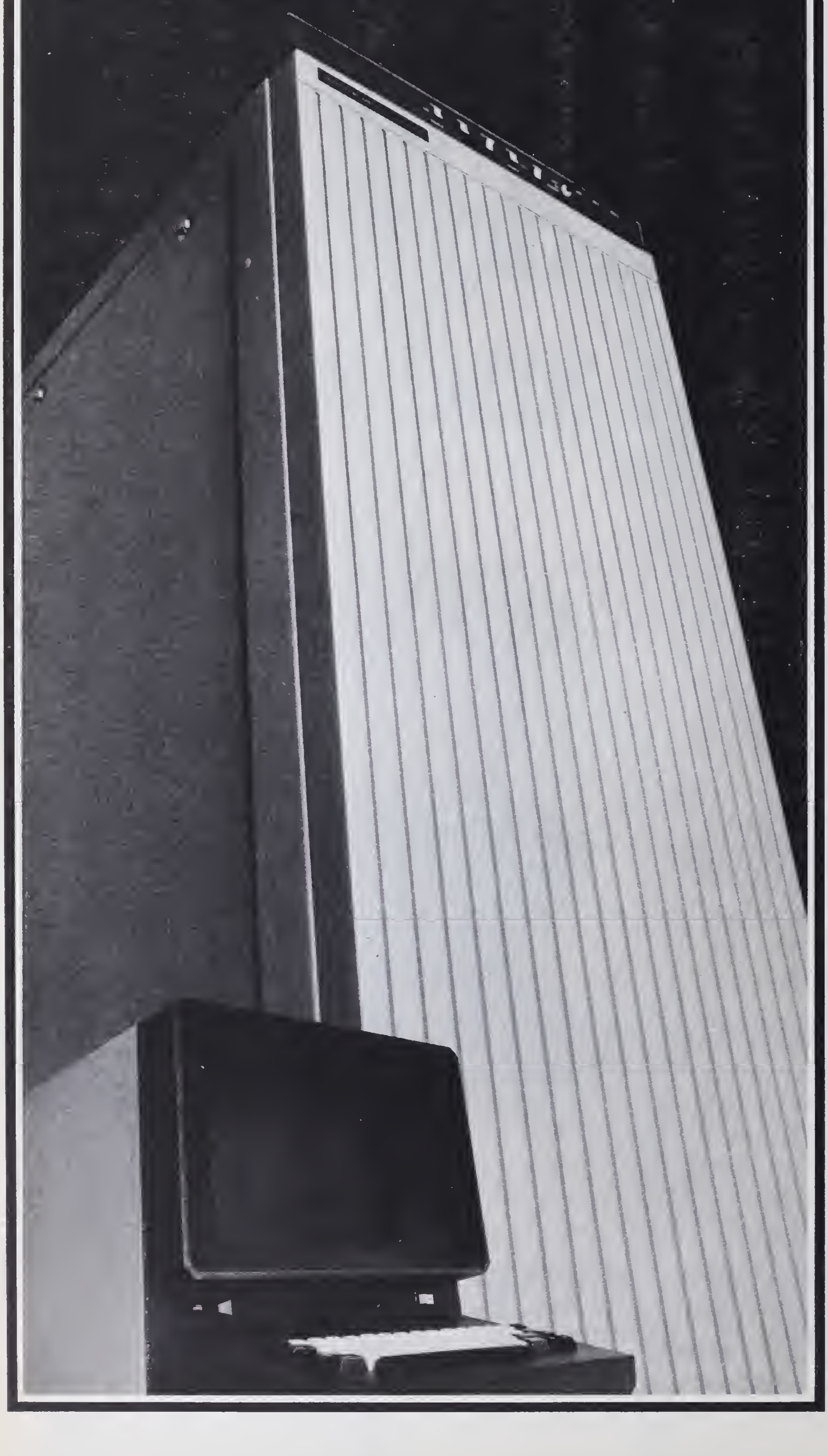
At BASF, we set our standards for the tough customers. And we're as much at home in the office environment as we are at large computer sites. Back in 1934, we invented magnetic recording tape... the forerunner of all of today's magnetic media. And being first, we've had a lot of time to concentrate on being best. If your application demands a disk pack, or any magnetic medium that meets or exceeds the industry's toughest standards, write BASF Systems, Crosby Drive, Bedford, MA 01730, or call (617) 271-4000 for the name of your nearest supplier.

Computer Tapes Disk Packs Floppy Disks
Cassettes Mag Cards

BASF

Ask our tough customers.

The new 3220 supermini from Perkin-Elmer. 32-bit performance at $33,500 with 60-day delivery.



Here's how to tell if the 3220 is for you.

1. You need 32-bit hardware and software performance: Your transaction processing system requires instantaneous terminal response. Your real-time control system must offer very high throughput. Your scientific programs must run incredibly fast and yield exceptionally accurate results.

2. You need help to develop programs quickly and easily: You need one language—COBOL—for all business applications, whether batch or transaction processing. You require multiple high-level languages. The faster you can identify programming errors, the faster you can correct them—so you really appreciate the value of our globally optimizing FORTRAN VII. It has a separate development compiler that produces object modules at a speed of 2,000 lines per minute. And with our Multi-Terminal Monitor, you can have 32 programmers working simultaneously with COBOL, FORTRAN, CAL MACRO, or RPG II.

3. You need a system with unmatched integrity: Your commercial data base needs to be fully safeguarded from media faults and system failures. Your scientific results require single- and double-precision floating point accuracy. And your time-critical, memory-resident programs for real-time control applications need the protection of our dynamic memory relocation and protect hardware.

4. You need 32-bit performance at 16-bit prices: The Perkin-Elmer Model 3220 starts at $33,500 (U.S. only). OEM's should ask about our quantity discounts and fast delivery.

5. You need a vendor that stands behind its products: Perkin-Elmer maintains a worldwide field service operation and offers a variety of support program contracts. We offer comprehensive hardware and software training courses. And we pride ourselves on responsive systems and software support.

Find out more about the remarkable 3220. Send the coupon for a fact file.

Perkin-Elmer • 2 Crescent Place
Oceanport, NJ 07757

Please send me your fact file on the 3220.

Name____________________ Tel.__________

Title______________________________

Company____________________________

Street______________________________

City____________ State______ Zip______

CW114

Or call toll free 800-631-2154. In New Jersey (201) 229-6800.

PERKIN-ELMER

Survey Finds Big Gap Between Best, Worst Paid

LAKE BLUFF, Ill. — Several tax brackets separate the least paid and highest paid telecommunications managers, A.S. Hansen, Inc. found in its 15th annual "Weber Salary Survey on Data Processing Positions."

The least paid telecommunications manager earned an annual salary of $13,000, while the highest paid took in $47,900, Hansen noted in the survey covering the period June 1978 through June 1979. National averages for telecommunications managers, senior telecommunications analyst/-programmer and the highest grade of telecommunications analyst/programmer without supervisory duties were all above $20,000 per year.

In terms of pay, the top 25% of telecommunications managers earned at least $32,000. The top 25% of senior telecommunications analyst/programmers — a class of software specialists who have supervisory responsibilities — earned at least $27,500.

The Hansen survey is a proprietary document marketed by the firm as a guide to those who administer DP departments or personnel. Hansen is located at 1080 Green Bay Road, Lake Bluff, Ill. 60044.

Utilities, Transportation Pay Best

(Continued from Page 57)

spondents according to type of installation — an index of technological sophistication. From this standpoint, the Hansen data showed a fairly strong correlation between a user's type of facility and its remuneration to telecommunications managers and senior telecommunications analyst/programmers.

The more sophisticated facilities, where communications can be crucial to DP operations, usually offer higher salaries to those two positions than do the less advanced sites.

However, Hansen did not post averages for certain installation types in certain city levels because of insufficient survey responses (see figure). And the basically positive correlation between technological sophistication and telecommunications salary level fell apart in the domain of Type One users — the least sophisticated installations — in Level One cities.

N.Y. Conference To Explore Productivity

NEW YORK — The social and economic consequences of new telecommunications systems will be explored at a two-day conference here sponsored by New York University's Center for Science and Technology Policy.

Slated for Jan. 29-30, the conference will address the impact of telecommunications on both public- and private-sector productivity, a center spokesman said.

Registration costs $75. More information is available from Dr. Mitchell L. Moss, Center for Science and Technology Policy, New York University, 329 Shimkin Hall, New York, N.Y. 10003.

Phone Companies Get Comm-Stor

INDIANAPOLIS — Indiana Bell Telephone Co., Inc. and South Central Bell Telephone Co. have gotten Federal Communications Commission approval to offer the Comm-Stor II communications storage unit.

The Comm-Stor II uses single- and dual-drive floppy diskette systems and provides low-cost message storage.

Comm-Stor II systems can be used with AT&T's Dataspeed 40/1 and 40/2 terminals as well as the Teletype Corp. Model 43 teleprinter and other asynchronous data terminals, the manufacturer said.

The storage unit is purchased under a general agreement which allows any of the Bell System operating companies and AT&T Long Lines to buy the units either for their own use or for marketing to their customers, according to Sykes.

Dear Ma:
Racal-Vadic now has a Triple Modem for remote terminal users too!

Racal-Vadic has really done it this time, Ma, with a direct-connect originate-answer TRIPLE MODEM for remote terminal and computer users.

It's a 212A, a 103 AND a VA3400 in a compact, low profile cabinet. Including the VA3400 at NO EXTRA COST is very important, Ma. There are over 50,000 in operation. Also, both Racal-Vadic and Anderson Jacobson have 1200 bps full duplex acoustic couplers built around the VA3400. And major terminal manufacturers are incorporating VA3400 modems in their latest equipment.

With TRIPLE MODEMS at remote terminals AND central computer sites, users can now standardize on Racal-Vadic and satisfy every switched network requirement from 0 to 1200 bps.

The whole story is much too long to tell in this letter, Ma. Better phone or write for complete details.

Your independent thinking son,

Alexander Graham Jr.

Racal-Vadic Member ICDMA
RACAL The Electronics Group
222 Caspian Drive,
Sunnyvale, CA 94086
Tel: (408) 744-0810 • TWX: 910-339-9297

Racal-Vadic Regional Offices: West: (408) 744-1727 • East: (301) 459-7430 • Central: (312) 296-8018 • Northeast: (617) 245-8790 • Southwest: (817) 277-2246

Available from these stocking reps...

Alabama: (800) 327-6600 • Alaska: (907) 344-1141 • Arizona: (602) 947-7841 • California: S.F. (408) 249-2491, L.A. (714) 635-7600, S.D. (714) 578-5760 • Canada: Calgary (403) 243-2202, Montreal (514) 849-9491, Toronto (416) 675-7500, Vancouver (604) 681-8136 • Colorado: (303) 779-3600 • Conn.: (203) 265-0215 • Dist. of Columbia: (301) 622-3535 • Florida: Ft. Lauderdale (800) 432-4480, Orlando (305) 423-7615, St. Petersburg (800) 432-4480 • Georgia: (800) 327-6600 • Illinois: (312) 255-4820 • Indiana: (317) 846-2591 • Kansas: (913) 362-2366 • Maryland: (301) 622-3535 • Mass.: (617) 245-8900 • Michigan: (313) 973-1133 • Minnesota: (612) 944-3515 • Missouri: (314) 821-3742 New Jersey: North (201) 445-5210, South (609) 779-0200 • New York: Binghampton (607) 785-9947, N.Y.C. (212) 695-4269, Rochester (716) 473-5720, Syracuse (315) 437-6666 N. Carolina: (800) 327-6600 • Ohio: Cleveland (216) 333-8375, Dayton (513) 859-3040 • Oregon: (503) 224-3145 • Penn.: East (609) 779-0200, West (412) 681-8609 • S. Carolina: (800) 327-6600 • Texas: Austin (512) 451-0217, Dallas (214) 231-2573, Houston (713) 688-9971 • Utah: (801) 484-4496 • Wash.: (206) 763-2755 • Wisconsin: (414) 547-6637

Manufacturer Oils Order Process

(Continued from Page 55)

Wats lines to an IBM 370/125 with 256K bytes of main memory, located at Avco's headquarters here. Another 440 system with five CRT terminals — used as a key-to-disk data entry system — is hardwired to the 370.

Avco dealers place more than 100 orders a day at each office, usually with five to 15 items per order. Between three and four times that many orders are placed during the peak harvest season of September, October and November, according to Joseph Dominik, Avco's director of systems and computer operations.

When a regional office receives an order, the part numbers, customer names and order quantities are keyed into the terminal. While it checks stock for an item, the 440 adjusts inventory and prints a complete order on a preformatted shipping form. A picking list is sent to the regional office's warehouse and is later returned to the operator to verify that all items were shipped.

After the order is filled, that information is transmitted daily by batch to the 370 and posted on central inventory records, keeping regional and central records consistent, according to the manager.

Dramatic Contrast

The computer-based system contrasts sharply with the manual system that preceded it. For one thing, the firm has eliminated 300 of its back orders, Dominik said.

"When a dealer called our regional parts department to find out what happened to one of his back orders, the response might have been either, 'I don't know where it's coming from,' or 'Coldwater has it.' Now, with our back order disposition report, an up-to-date and accurate status can be supplied to any requester at the touch of a button," Kinzer explained.

The automated system has reportedly reduced the number of incorrect back orders resulting from transcription errors and has eliminated the time lag inherent in the order system, Kinzer indicated.

The computer scans the inventory of all five locations daily, indicates low level stock and triggers an order to replenish it. When Coldwater receives shipping lists or back orders from a regional office, the other offices are automatically scanned to determine the location or locations of parts that can be shipped in the shortest time.

If an order from Fort Dodge, Iowa, can be shipped fastest from Harrisburg, Pa., for example, the IBM system will trigger a shipping order from Harrisburg to the Fort Dodge dealer. "It's a very coordinated and integrated control system," Dominik declared.

"Such an arrangement places complete control in the hands of each regional office. When one of our regions transmits order information to the home office, it is telling us, 'Go ahead and bill the customer.' We have a very efficient and prompt centralized billing system."

Dominik said a 3% increase in Avco's abililty to fill orders justifies by itself the cost of the Northern Telecom system. Its cost represents about .03% of Avco's gross sales.

Conversion Process

The director of systems and computer operations characterized the conversion to the Northern Telecom system as "not very difficult." The firm dedicated nearly two months to the process, during which both the manual and automated system were run in parallel.

"There is usually some resentment and people think the new system is above their heads, but I think we made the transition very well. The people here were surprised at how quickly they began to realize the benefits of the system."

Dominik feels the improved company performance has increased customer satisfaction.

Avco's 440 regional systems are the second upgrade the firm has given its remote data entry system since it was launched three years ago, when it started with the smaller Northern Telecom 410 system (with 48K bytes of memory). The switch to the 440 was made in 1978 to improve speed and increase memory to 64K bytes.

The system will be expanded again in 1980, when it is upgraded to Northern Telecom's larger, faster 450 system, Dominik said.

FCC Rules On Mobile Units

WASHINGTON, D.C. — Police and fire department radio services may employ digital voice modulation as a result of a Federal Communication Commission (FCC) decision that makes "permanent" certain hitherto "interim" rules and standards for mobile data communications.

Manufacturers of equipment used in these services will be permitted to remove the low-pass filters from digital transmitters on a permanent basis, the commission announced recently.

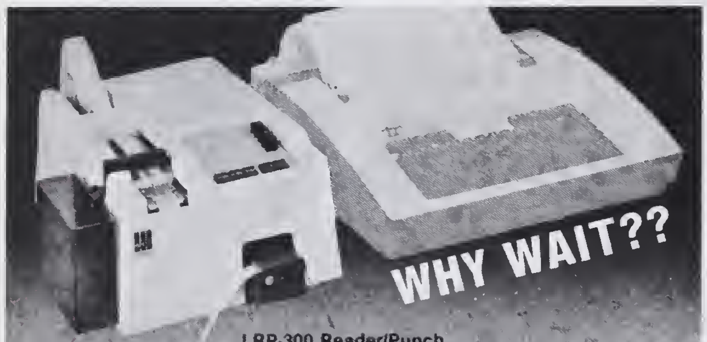
IEEE Seeks Papers For Power Conference

MONTREAL — Technical papers for the 1980 Canadian Conference on Communication and Power have been invited by the Institute of Electrical and Electronics Engineers.

The conference will not be limited to issues of direct concern to data communications specialists. But topics slated for discussion include the impact of microprocessors and distributed intelligence in telecommunications, image and speech processing techniques and applications, simulation and optimization in telecommunications and communications applications of fiber optics.

The conference will be held in Montreal Oct. 15-17, 1980 at the Queen Elizabeth Hotel. Authors should submit three copies of both a 500-word summary and a brief biographical note by March 1, a spokesman said. Notification of acceptance will be made by April 1.

Papers may be a maximum of four standard pages and will be published in the conference proceedings. Inquiries should be addressed to Yvon Gervais, Ecole Polytechnique, CP/PO Box 6079, Succ. A, Montreal, Quebec, Canada H3C 3A7.



LRP-300 Reader/Punch

Cost Effective ASR For Your Terminal... ...NOW!

DELIVERY FROM STOCK
Only $1495.00

DSI's LRP-300 Reader/Punch Combo adds 300 baud ASR storage and edit capability to any RS-232 or TTY current loop terminal. Just plug in between terminal and modem and you're ready to go. Our whisper quiet field-proven MODUPERF system is backed by a one year warranty. At only $1,495, the system pays for itself by improved accuracy, data throughput, and reduced line charges in a matter of months. Don't wait to go ASR. Order your LRP-300 and start saving line costs NOW.

DEALER INQUIRIES INVITED.

dsi
DATA SPECIALTIES, INC.
3455 Commercial
Northbrook, IL 60062
(312) 564-1800 TLX 206230

Product of U.S.A.

John H. Crilly, President
Sun Data, Inc.

"Why do you think SUN DATA is the fastest growing IBM GSD dealer?"

If you say darn good delivery schedules, I agree. Sun Data can put the computer you want, where you want it, in weeks—not months! Our on-the-spot inventory is an industry first.

If you say fiercely competitive pricing, I agree again. Sun Data meets any other pre-owned equipment dealer's price head-on.

If you say unequalled engineering 'moxie', I agree 100%. Sun Data's technical specialists are veteran IBM system engineers. They refurbish Sun Data acquisitions to a "T".

If you say what makes for Sun Data's rapid success is a superb record of satisfied customers, I agree again. A very large percentage of our business is by referral and that makes us proud as peacocks. For these reasons, I personally feel that Sun Data may very well be the number one IBM GSD dealer by the end of 1980.

So the next time you need pre-owned equipment, call Sun Data. You'll be doing business with the fastest growing hardware dealer in the USA.

Sun Data, Inc. **(800) 241-9882**

6185 South Buford Hwy., P.O. Box 105046 • Atlanta, Ga. 30348 • (404) 449-6116

Pocket Unit Coming Out

(Continued from page 55)

take advantage of the features of acoustic and direct-connect modems," Henriksen said.

American Teledata plans to market a number of modems, starting with those that have RS-232C interface capability. The first models will reportedly include a cable to interface to such popular terminals as the Teletype Corp. Model 43 and the Digital Equipment Corp. LA36.

All modems are answer/-originate, with full- and half-duplex operation and include features offered by makers of acoustic modems. The firm plans to offer other interfaces, along with another modem styled for placement under the phone. Although the modem's price has not been fixed, the firm expects to sell it for less than $300, Henriksen said.

The hybrid circuit will be available to modem manufacturers early this year.

VITAL RECORDS PROTECTION

Off-site record protection programs are like part-time insurance policies because some vital records are always on-site. Wright Line Data Bank™ safes provide the on-site protection needed to balance off-site programs. A dozen sizes are available for magnetic, film and paper media. May be leased or purchased. For further information, circle the readers' service number or write: Wright Line, Inc., 160 Gold Star Boulevard, Worcester, Massachusetts 01606.

FOR DATA PROCESSING ACCESSORIES AND SUPPLIES, YOUR . . .
single source with **super service**

Wright LINE

Design and Implementation

Cassette Course Covers Communications Basics

WOODLAND HILLS, Calif. — A 16-hour cassette course has been designed to instruct professionals in the basics of data communications system design and implementation.

The package, consisting of audio cassettes and a 650-page workbook, is aimed at those persons currently working in data communications or who manage DP or data communications facilities. No prior communications experience is required to benefit from the course, according to Info III, which offers the four-part course.

Module I, ''Introduction to Data Communications,'' outlines the basic elements of a DP system and how data communications relates to it. The module discusses communications terminology and systems interface and protocol requirements.

''Data Handling Transmission Techniques and Limitations, Equipment and Support'' discusses handling transmission techniques and their relation to the support requirements and limitations of a communications system. This second module also covers such items as digital-to-analog converters, serial and parallel modes, synchronous and asynchronous transmission and modems, according to course author Kenneth Sherman.

Module 3, ''Common Data Communications System Problems and Solutions, Design Considerations,'' deals with reliability characteristics. It discusses system integrity with respect to recovery sequence, backup and downtime cost. Test procedures and equipment and analytic and diagnostic equipment are also covered.

The third section also covers hardware, software and network growth requirements, specific design applications and the problem of underestimating system complexity, Info III said.

The fourth section is called ''Trends and Future Data Communications Systems.'' It discusses fiber optic transmission, satellite and digital communications systems and network services. Information is included on the latest digital communications technology and its implementation.

The entire program costs $995. The first module is available for $325 from Info III at Suite 107, 21250 Califa St., Woodland Hills, Calif. 91367.

Samoa Gains Globcom Tie

NEW YORK — The U.S. territory of American Samoa should be able to reduce its dependence on high-frequency radio communications with the introduction of an RCA Global Communications, Inc. (Globcom) satellite connection.

The direct link provides for Telex, telegram and leased-channel services and is said to provide for higher operating efficiencies and allow a higher volume of communications traffic than the radio system.

The system will allow the government of American Samoa to fully automate its Telex exchange facility, according to RCA. Customers sending Telex messages to and from the territory will automatically be switched to destination points without manual intervention.

The satellite communication system originates at the Jamesburg, Calif., earth station, which transmits to an Intelstat IV satellite above the Pacific Ocean. A matching earth station is located in Tafuna, near Pago Pago.

DEALERS WANTED
Represent our popular line of Acoustic Couplers and Minifloppy Discs.
GOOD TERMS • HIGH MARGINS
Digicom Data Products, Inc.
(408) 279-8711
Ask For Bill Backus
1440 Koll Circle, San Jose, CA

Info-guard.™
Your Key to Data Network Security.

The Power.

The threat of unauthorized access, modification and utilization of transmitted data is everywhere. User exposure to electronic fraud is increasing dramatically as financial institutions move further into EFT, and as government, business and industry decentralize data processing systems.

The need to protect highly confidential data transmissions from intruders is obvious. And if you're going to invest in a security system for your data communications network, you should install the best one available.

Info-guard.

Info-guard is a proven encryption system that uses the powerful Data Encryption Standard (DES) algorithm. It automatically enciphers plain text into encrypted transmissions that are unintelligible to intruders.

In any encryption system, even those using DES, the strength of the system depends on the security of the key. With Info-guard's unique Key Management System, the key is electronically stored and transmitted. No human can ever know or determine exactly which key is in use.

And, if anyone should tamper with any element of the Info-guard system, all cipher keys are automatically erased.

Info-guard. The best available technology for providing maximum data network security.

Codex, a world leader in data communications technology, is dedicated to providing a wide range of advanced products to meet the demanding requirements of on-line data communications networks.

Codex – The Power in data communications!

codex
We'll get you through

member of IDCMA
Codex Corporation, 20 Cabot Boulevard, Mansfield, Mass. 02048 • Tel: (617) 364-2000 • Telex: 92-2443
Codex Far East, 2-8, 1-Chome, Yotsuya, Shinjuku-ku, Tokyo 160, Japan • (03) 355-0432 • Telex: 2324976
Codex Europe S.A. Av de Tervuren 158, 1150 Brussels, Belgium • Tel: (322) 762.23.51 • Telex: 26542

Introducing
COMPUTERWORLD BOOKS

Listed below is a selection of titles from the first offerings of our new reader service, *Computerworld Books*.

Some of the books deal with various aspects of data processing, while others cover more general management topics. All of them have been selected by our editors for their relevance and usefulness to growth-oriented computer people.

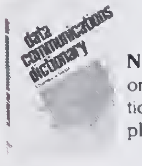
In the future, we plan to include instructional materials other than books, and we also have plans to publish books on topics we consider to be important. We welcome your comments on these plans, our current selection of titles, or on other matters concerning this new service. Send them to *Computerworld Books*, attention editorial staff.

Meanwhile, we hope you'll look over the titles below and order those which you feel can be of use to you. A coupon is included for your convenience, and we'll be happy to bill you later. Remember that all books are sent to you risk-free, with a full 15 day trial period!

WJ044. Information Retrieval Systems: Characteristics, Testing and Evaluation, 2nd Ed. *F. Wilfred Lancaster.* This new edition is expanded, and provides broader coverage on information storage and retrieval. The focus is on the "intellectual" aspects of systems and services. It examines factors such as user-system interaction, search strategy, indexing, and vocabulary control with emphasis on design and evaluation aspects. $19.95

BP026. An Introduction to Distributed Data Processing, *Harry Katzan, Jr.* A thorough understanding of the most recent developments in data processing is provided by a graphic and comprehensive analysis of the current and future impact in planning and implementation procedures. The text is divided into three parts: Management Overview, Data Communications Concepts , and Distributed Systems Concepts with special emphasis on organizational changes, vital economic considerations, plus important selection criteria when choosing equipment. $17.50

NV007. Encyclopedia of Computer Science, *Edited by Anthony Ralston and C. L. Meek.* The first and only one-volume computer science encyclopedia, with more than 480 articles and 1,000 illustrations, tables and charts covering every aspect of the discipline. It is divided into five broad areas: computer science, information processing, information sciences, data processing and symbol manipulation. Subdivisions include software, hardware, languages, programs, systems, mathematics, networks, applications, theory, history and terminology. $60.00



NV009. Data Communications Dictionary , *Charles J. Sippl.* The only single-volume source of data processing and communications definitions. Clearly explains more than 14,000 concepts , working terms and phrases, acronyms and abbreviations. $19.95

NV018. Data Processing Contracts: Structure, Contents, and Negotiation, *Dick H. Brandon and Sidney Segelstein.* Take the risk out of buying or renting computer products and services. Here's a detailed framework for structuring and negotiating airtight contracts that clearly stipulate the responsibilities of both user and vendor. Over 250 specific contract clauses, covering the purpose of each, the types of contracts in which they are used, and their risk ratings and fallback alternatives. Learn about clauses that are essential for maximing cost savings and minimizing the possibility of dispute and litigation. $34.50

WJ046. Principles of Data Processing, 2nd Ed. *Robert A. Stern and Nancy B. Stern.* A totally revised edition that offers expanded coverage of COBOL and BASIC. Now you can write simple even intermediate-level programs in these languages plus read two others — FORTRAN and RPG. Special Emphasis is on the interaction between computer specialists and business people, synthesizeing EDP operation from both points of view. $17.95

WJ042. The Art of Software Testing, *Glenford J. Myers.* New ideas and techniques for finding and eliminating software bugs. Includes practical advice on the management aspect of testing, test tools, highest order testing, debugging and code inspection. Programmers at all levels will find the comprehensive information indispensible. $17.95

NV002. Systems and Programming Standards, *Susan Wooldridge.* A wealth of practical ideas for simplifying the design of new standards and the improvement of existing ones. Defines the purpose, types and levels of standards and outlines the contents of model systems and programming standards manuals. $13.95

NV003. RISS: A Relational Data Base Management System for Minicomputers, *Monte Jay Meldman, Dennis J. McLeod, Robert J. Pellicore, and Morris Squire.* The first book to describe a complete minicomputer relational data base management system and its implementation. Coverage includes the design approach and structure, the user interfaces and how the system can be put to practical use. $14.95

WJ041. Principles of Discreet Event Simulation, *George S. Fishman.* How to choose the best methods for modelling, programming and executing simulations and analyzing results. $24.50

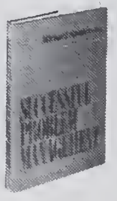
NV001. Documentation Standards and Procedures for On-Line Systems, *Martin L. Rubin.* A Unique aid to developing new company standards, this convenient manual provides standards and procedures to replace outdated batch system procedures that can be readily adapted to a wide range of hardware and software environments. $21.95

BP029. Distributed Information Systems, *Harry Katzan.* This book breaks new ground for computer professionals, engineers, and managers of DP facilities in the way it covers the basic concepts, the technology, and the managerial intricacies of distributed information systems. $20.00

BP022. Software Quality Management, *John D. Cooper.* The first comprehensive exposition of practical software quality tools and techniques. Includes discussion of standardization, a realistic approach toward the generation of quality software, problems facing managers of software development, program managers, program assurance managers and corporate managers. $20.00

SC047. Assemblers, Compilers, and Program Translation, *Peter Calingaert.* A comprehensive view of all types of translation programs. Covers translation objectives, source languages, translation mechanisms, simple and complex assemblers and macro processors. Interpreters are covered explicitly, as are linkers and loaders. $17.95

WJ032. Writing for Results, *David W. Ewing.* How to put your ideas across in writing, clearly and forcefully. This new edition of a best-seller makes learning to write faster and easier. $18.95



WJ037. Successful Problem Management, *Michael Sanderson.* A totally new methodology for quickly detecting and resolving complex problems with confidence, imagination and control. Building-block approach can be quickly adapted to specific situations. $17.95

WJ040. Project Management, *Melvin Silverman.* Called a "highly effective tool for turning technical experts into management experts," this course takes you step-by-step through every aspect of what you need to know to become a competent project manager. Includes details of how to pick a team of section managers and command their loyalty — how to jump from planning to controlling — how to finance and budget — how to cope with management — and much more. $34.95

WJ030. Moving Up Quickly. *Thomas L. Weck*, ". . .a gold mine for those of us who must deal with the process of change in a mobile corporate world." Succinctly describes the necessary steps in searching for and finding the right job. "Thorough, concrete and practical." $12.95

JD053. The Chief Executive's Handbook, *Edited by John D. Glover and Gerald A. Simon*, A series of "interviews" with chief executives from a wide range of industries. You'll learn about the ideas, hunches, observations and ruminations of 85 chief executives of both small and large companies. Includes Robert McDonald of Sperry Rand and others. $37.50

WJ031. Dictionary of Business and Management, *Jerry M. Rosenberg*, With more than 8,000 entries, this is the most extensive reference of business and management terms and concepts ever published. More than 40 areas of business are represented, including data processing, marketing, accounting and management. $25.95

WJ038. Effective Presentation, *W. A. Mambert.* Here is a complete, step-by-step course that can help you to become a dynamic speaker and a skilled communicator who can command the undivided attention of an audience. You learn everything there is to know about how to plan, organize and execute highly professional presentations that motivate people. Personnel and technical people can use these techniques to conduct training seminars. $34.95

MAIL THIS NO-RISK COUPON TODAY!

Mail to: *Computerworld Books*
925 North Milwaukee Ave., Wheeling, Il 60090

Please send me the following book(s):

Code	Quantity	Title	Total Price

Total cost (Illinois residents add 6% sales tax) ____

15-Day Free Trail! I may read the books for 15 days, and, if not satisfied, return them, and you will refund my money or cancel my invoice.

☐ I prefer to pay now and save shipping charges of $1.25 for one book and 50 cents for each additional book. My check or money order is enclosed.

☐ Bill me later

Name ____

Firm ____

Address ____

City ____ State ____ Zip ____

Computerworld Books CW1140

STRUCTURED WALKTHROUGHS

A Practical Approach in a Real-Life Environment

Presenter, Coordinator, Scribe and Reviewer play key roles in a walkthrough. But tension and infighting frequently occur. Here's how to minimize conflicts and pull those roles together.

By Rita Shoor

In the brief annals of data processing history, certain professional and personal characteristics have become associated with DP technicians. We have been depicted as both brilliant intellectuals and slaves to nonthinking machines.

We are described as lonely introverts who are only capable of successful communication when dealing with a computer. At the same time, we are the bright boys of industry, since no business of appreciable size can afford to bypass the instant access to information that DP makes possible. All of these caricatures contain elements of the successful technician's personality.

However, there is one trait common to most of us. Within the breast of every competent programmer, designer and analyst beats the heart of a finicky, detail-oriented perfectionist.

We refuse to accept results that are "almost right" or "reasonably corrector "in the ballpark." Small wonder that we attempt to make every program and design a flawless gem. In order to confound our nervous systems even more, we are often expected to generate our products in a time frame that may be euphemistically referred to as unrealistic.

Given this state of things, I try to gain an awareness of any technique that enables the professional DP technician to gain his desired goal (the perfect program, design, procedure manual or piece of documentation) with the least amount of internal stress. However, I have a full share of the healthy skepticism inherent to many DPers. I prefer to experiment with any new approach to problem-solving in order to determine its value rather than to accept it with open arms as the answer to everything because it is new and different.

It was with this attitude that I approached the concept of the structured walkthrough.

Yourdon's Definition

Within the last few years, this innovative technique has begun to make its presence felt in many DP installations. What exactly is meant by the term "walkthrough?" According to Edward Yourdon, author of *Structured Walkthroughs* and the man responsible for making this approach essential to the development of many new system applications, it is "a peer group review of any product."

The product might be a general system design, a program specification or the program source code. It can be a memo that describes to an end user the analyst's conception of what the system is expected to generate. It can be a document that outlines the responsibilities assigned to various systems when system interfaces are necessary. In short, the product is any formal document that is integral to the development or enhancement of a computer system application.

The peer group that reviews the product may consist of any number of personnel who can provide insight into the development of a satisfactory document. The members of the peer group change depending upon the product being reviewed.

For example, if the document is a definition of the calculations to be performed when updating a pension benefit file, the presence of programmers is probably superfluous. On the other hand, the attendance of the actuary who specified the calculations to be in compliance with the Employees Retirement Income Security Act would be mandatory. However, when reviewing the code of the program written to perform these calculations, the programmers are necessary and the actuary *may* be superfluous.

As a consultant, I've had the opportunity to work on a team that utilized structured walkthroughs in both the design and programming phases of developing a new application system. During the course of system development, all the team members functioned in all the major roles required by the structured walkthrough process. As with any new technique, we modified the formal roles to suit our particular needs.

A review of this technique from a practical, experimental viewpoint, rather than a theoretical one, may provide useful guidelines for those of you who are now using or will in the near future consider using walkthroughs in your own installations.

Role of Presenter

The first role is that of the presenter. This is the person who will present the document to be reviewed during the walkthrough. In most cases, the presenter is also the author of the document. This is because the author is the person most capable of answering any questions raised during the walkthrough.

Using the author as presenter, however, brings up one of the major problems that can arise during a structured walkthrough. The purpose of a walkthrough is to generate as perfect a product as possible. In order to do this, the reviewers must point out any errors, misconceptions, deviations from standards or potential problems they discover as they review the document.

The author of the document must realize that the criticisms that come up during the walkthrough are not directed towards him but towards his product. He must view his creation as dispassionately as he would if it were the result of some other person's blood, sweat and tears.

It is essential to achieve this objectivity if you want to avoid screaming battles during the walkthrough session. One technique we found useful was to avoid using possessive pronouns and adjectives. Rather than referring to "my program," I spoke about "the program." Instead of justifying an oversight by saying "I want to do it this way," I talked about "the original design concept."

Granted, this is actually a way to subconsciously trick yourself. It works.

At one point during a design walkthrough, a programmer trainee with three months of on-the-job experience hesitantly pointed out a rather basic flaw in the design. After several minutes of thorough, but not heated, discussion, it was apparent that the trainee was correct in her perception of the oversight.

It was largely because we both referred to design concepts and system requirements rather than using statements of the "Why-did-you-do-it-this-way?" variety that I was able to accept her suggestion and make the necessary modifications without feeling unduly embarrassed.

'Egoless' Approach?

This psychological sleight of hand was as close as we came on the project to practicing egoless programming or design. The egoless approach seemed ideal when we began the walkthroughs. However, it didn't work in practice. Perhaps this is be-

(Continued on In Depth/2)

(Continued from In Depth/1)

cause writing a program or designing a computer system requires creative thought and energy.

The popular media are fond of portraying DP technicians as unemotional robots who function purely on a rational basis. Sometimes we enjoy this self-image. But when one has expended weeks or months of concentrated effort to produce a program or design that is logical, efficient and satisfies all end-user requirements, it is difficult to remain objective.

The desirability of the egoless concept was a matter of debate among all of the people who worked on the project. Although the debate was never finally resolved, the consensus was that personal involvement with the end product was unavoidable.

In addition to producing the document, presenting it to the walkthrough attendees and answering any questions about it, the presenter has several major responsibilities both before and after the walkthrough session. He must select the coordinator and the reviewers who will participate in the walkthrough. It is his decision that governs who will criticize the product.

Our project team consisted of a project leader who also functioned as a programmer/analyst, two other programmer/analysts including myself and two to three programmers. The number of programmers was dependent upon the stage of the project in development. In most cases, all of the systems and programming staff who were actively working on the project were invited to all of the walkthroughs.

When the product being reviewed was a design or analysis document, the end user of the department involved was also asked to attend. Since the new system would affect several different departments, there were certain design phases that multiple end-users had to review.

In order to avoid having more than six people at any walkthrough, we had double sessions on those portions of the system that interfaced with multiple departments. In these cases, the first walkthrough was geared to the technical staff. The reviewers were all members of the project team and occasionally included a representative from the software support area.

Second Walkthrough

The second walkthrough was for the purpose of presenting the product to the end users. The only DP attendees at these sessions were the presenter of the document and the project leader. Although this procedure seems to involve double the amount of work, time and effort, it enabled us to keep the number of attendees to a reasonable figure.

A walkthrough session that involves more than six or seven people often turns into a lecture by the presenter. There are no questions or interaction among the reviewers. If, on the other hand, all of the reviewers choose to actively participate, a large group makes it impossible to hold the sesions to a 60-minute time limit. This is a definite maximum.

There were several occasions when the walkthroughs extended past one hour. We inevitably found that our concentration began to disappear and that the last part of the extended walkthrough degenerated into arguments about relatively minor questions.

This timing constraint points out a potential problem that was never satisfactorily solved. Yourdon recommends that within 60 minutes, "one can expect to walk through 50 to 100 lines of code, one to three pages of a Hipo diagram or structure chart or five to 10 pages of a written specification." He recommends that when a large product is being developed, the walkthroughs should be done on one portion at a time. He then points out that "a top-down structured approach makes this easy to accomplish, since it organizes a system into a hierarchy of modules, each of which can be reviewed independently."

When attempting to implement this approach, our project team encountered several difficulties. First, we could not justify breaking "one-time" programs and/or specifications into multiple modules. I'm referring here to the stepchild of most new system applications — the conversion program.

While the modular approach is a good one when applied to a new product that will be used by various people

This could be your lucky list

It's what we have available. If it's also what you need, you just saved yourself a lot of money.

Take a look at what we've got to offer. If it matches up with what you need, you just saved a lot of money.

What you'll pay for our refurbished-like-new units is a good deal less than what you'd pay for these models brand-new.

Every unit we sell is accompanied by a guarantee that it has been maintained according to IBM's strict standards. So you know you're getting equipment that's in top-notch operating shape.

And even if your requirements aren't listed here, ask us anyway. There's a good chance we can help you with them. Call or mail the card today.

370/115

6 or 12 Month Leases Available
We can configure to meet your needs. Delivery—30 days.

Call John Ferguson or Mike Nelson

370/138

3138-J00 Processor (1Meg)
Available: March 1, 1980
Sale or Lease

If you have a 370/138 that you would like to sell or lease, let us know today. We will buy it or sublease it for you.

Call Mike Nelson

370/125

3125-H02 Processor (256K)
Available: Now

3125-I02 Processor (512K)
3203-002 Printer (1,200 LPM)
2501-B01 Card Reader
3340-A02 Disk Drive
3340-B02 Disk Drive
3344-B02 Disk Drive
3410-003 Tape Unit
3411-003 Tape Unit
Available: February 15, 1980
Save over $5,000/Mo.

3125-GF2 Processor (192K)
Available: Now

Call Ken Bouldin or John Ferguson

IBM MAINTENANCE GUARANTEE!

All machines sold or leased by Econocom are fully guaranteed for IBM maintenance certification. Our installation coordinators handle all details to insure a smooth installation.

WANT TO BUY

S/3-Model 15's
System/32's
System/34's
3741's and 3742's
370/125's
370/138's
370/145's
3340/3344/3350

Call Betty Wildman

ECONOCOM 901-767-9130

Computerworld

Want to buy? Or sell? Or lease?

Give us a quick rundown of your requirements on the form below and we'll get back to you right away with some interesting figures.

I want to buy ☐ sell ☐ lease ☐ the following equipment.

MACHINE	MODEL/FEATURE	DESCRIPTION

Name ____________________ Title ____________

Company ____________________

Address ____________________

City ____________ State ____________ Zip ____________

Telephone (   ) ____________

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 6094 MEMPHIS, TN

POSTAGE WILL BE PAID BY:

ECONOCOM

ECONOMIC COMPUTER SALES, INC.
POST OFFICE BOX 17825
1755 LYNNFIELD ROAD
MEMPHIS, TENNESSEE 38117

over an extended period of time, we decided it would be counter-productive to spend an inordinate amount of time designing the conversion program into separate modules which would then be coded, documented and require separate walkthroughs. Conversion programs become meaningless after they have successfully performed their function — converting old file(s) into the format required by a new system. It is useless to have new people learning the layout and design concepts that govern the "old" file organization. It ceased to have meaning once the new file has been created.

We found that the conversion design walkthrough was useful because many of the calculations that would be used in the new system were reviewed by the end user at an early date. This enabled us to avoid carrying over inaccurate calculations to the new system design.

However, in retrospect, the walkthrough of the conversion program code was a waste of time. Since the program included more than 1,000 statements, it was necessary to have multiple walkthroughs. Because the file conversion involved gathering data from three different files and allowing for the possibility of records being missing from any one of these files, the code was very complex.

In order to understand the logic, the programmers on the team spent an excessive amount of time reviewing the program. They acquired familiarity with files which would not exist in the new system. The contributions of the reviewers to the end product were not worth their time and effort.

Time Well Spent?

A second objection to reviewing a maximum of 100 lines of code at any walkthrough is that management may object to technicians spending large amounts of time reviewing code rather than writing programs. Each walkthrough can require several hours from all involved personnel. Until some objective statistics are published proving that this time actually results in the development of an application system which is more satisfactory and cost-effective than one that is developed without the benefit of the walkthrough process, company managers are going to view this technique with a jaundiced eye.

It would be well for project leaders who are considering the walkthrough approach to maintain their flexibility. The guidelines for this technique must be adapted to your own organizational and political environment.

Another question must be considered by the presenter when he is making up his invitation list for the walkthrough. Should the supervisor who performs one's salary reviews be present during one's walkthrough sessions? The answer on our project was a resounding "No!!"

The reasons are obvious. If the person who controls your salary raises objetions to your product, the tendency is to accept his opinion with little, if any, argument. The presence of anyone higher than a project leader within the systems and programming hierarchy seems to reduce inexperienced programmers to complete silence.

They don't want to appear foolish or nonproductive. They hesitate to ask for explanations. The chance of a programmer trainee questioning the validity of a design or program under these

(Continued on In Depth/8)

370/145

3145-K00 Processor (2 Meg)
3047-001 Power Unit
3333-011 Disk Storage
3330-011 Disk Storage (2)
2803-001 Control Unit
2401-005 Tape Unit (2)
3811-001 Control Unit
3211-001 Printer (2,000 LPM)
2501-B01 Card Reader
Available: March, 1980
$410,000

3145-J00 Processor (1 Meg)
3047-001 Power Unit
For Lease
Available: February 1, 1980

Check Reader Sorters
1255-3 1419-1
Available: March 15, 1980

3145-I02 Processor (512K)
3047-001 Power Unit
Available: February 1, 1980
Call Verlyn Sims

S/3 Model 15

5415-D24 Processor (256K)
3277-001 Console
5421-002 Control Unit
1403-002 Printer (600 LPM)
3340-A02 Disk Drive
3344-B02 Disk Drive
3741-001 Data Station
3277-002 Displays (6)
Available: March 15, 1980
—Save 35%—

5415-D21 Processor (160K)
3277-001 Console
5421-001 Control Unit
1403-002 Printer (600 LPM)
3340-A02 Disk Drive
3741-001 Data Station
Available: February, 1980
—Save 38%—
Call Jack Goodman

Peripherals

3880's
We have machines shipping in January, March, April, and June. Call for prices and information.

Disk/Tape
For Sale or Lease
3340 Model A2's and B2's
3344 Model B2's and B2F's
3350 Model A2 and B2
3411 Models 1, 2 and 3
3410 Models 1, 2 and 3

3420 Tapes
Sale or Lease/Quantities Available With or Without Control Units

Also Available
1403-N1 Printers
3211-01 Printers
2501 Card Readers
3540 Diskette I/O
Call Bob Ford

Interested in a purchase-leaseback arrangement? Call us at 901-767-9130.

S/34

Used Systems:
5340-C23 CPU (64K/27MB)
5211-002 Printer (300 LPM)
5251-011 Displays (3)
Available: February, 1980
—Save 20%—

5340-E35 CPU (128K/128MB)
3262-B01 Printer (650 LPM)
5251-011 Displays (5)
Available: 60 Days

NEW
S/34 DELIVERY POSITIONS
S/38 DELIVERY POSITIONS
Call Roger Odom

S/3 Model 12

5412-B17 Processor (48K)
5203-003 Printer (300 LPM)
3340-C02 Disk Storage
5471-001 Printer/Keyboard
3741-001 Data Station
$43,500
Call Roger Odom

S/32

Several Systems Available During February, March and April.

3741 and 3742
Data Recorders
Call For Special Prices

3277
Displays
Also Control Units
Call Gayle Drotar

ASK OUR CUSTOMERS

The best reference is a satisfied customer. Contact us and we will send you our customer reference list containing over 100 of the nation's leading companies that have bought or leased systems from Econocom. Names like ITT, PPG, Xerox, Georgia-Pacific, Coca-Cola, Sunbeam—and many, many more!

ECONOCOM
Economic Computer Sales, Inc.
1755 Lynnfield Road
P.O. Box 17825
Memphis, Tennessee 38117
Telephone 901-767-9130
TWX: 810-591-1205
Member: Computer Dealers Association

ECONOCOM 901-767-9130

LA34 OPTIONS

Edge Can Deliver Now!

- **Top of Form Control**
- **Vertical Tabs**
- **Skip-Over Perforation**
- **110, 150, 300, 1200 Baud**
- **Automatic Answerback**
- **20ma Current Loop**

Serviceable & Priced To Sell
Memory/Editing Also Available

EDGE
Technology
Inc.
3743 SE 21st, Portland, OR 97202
(503) 231-1057

INTERACTIVE USER REPORTS

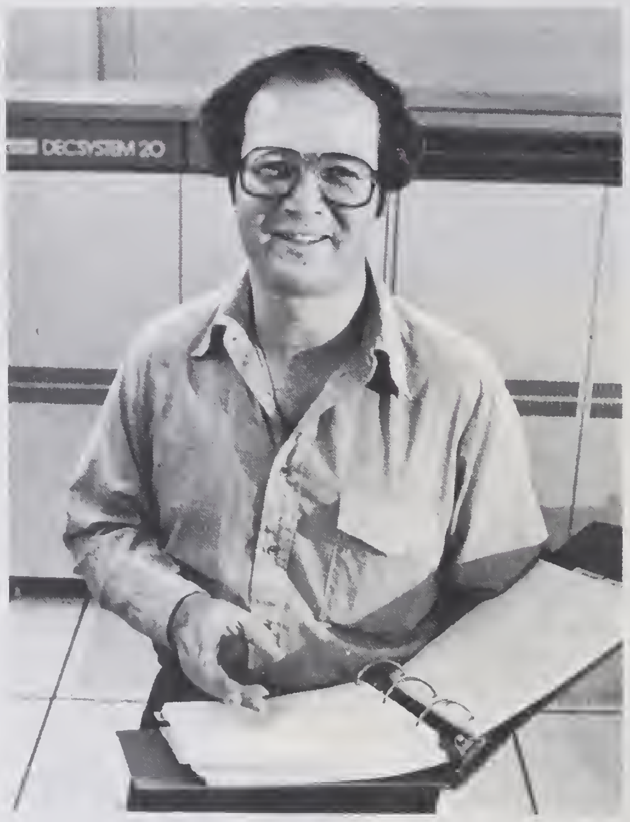
"A friendly operating system."

Ease of Use.

"At Wellesley College we wanted to develop a plan that would encourage our faculty members to integrate computer usage into their courses.

"We needed a computer with a 'friendly' operating system, one that was both powerful and easy to use. A system simple enough for beginners but with extended capabilities for sophisticated research work.

"The DECSYSTEM-2040 with the TOPS-20 operating system was perfect for us. It's easy for the novice to use, yet has the ability to run a wide variety of high-level languages and applications software. We're also delighted with the large library of excellent courseware we've been able to obtain from other colleges and universities."



Gene Ott, Director of Computer Science, Wellesley College, Wellesley,Mass.

Versatility.

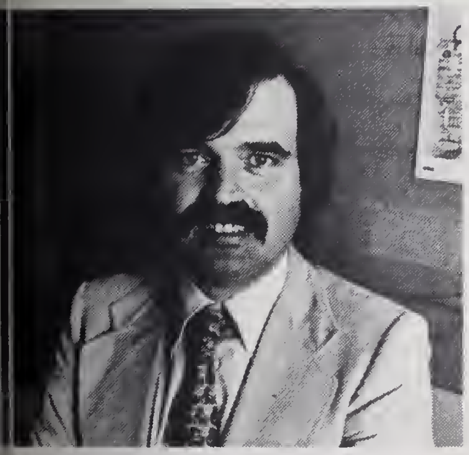
"AMS specializes in custom projects—where we design, write, and implement an application for a client's special needs and then sell it on a timesharing basis. Our mix of clients reflects a wide variety of needs. Some want instant information on manpower resources and management planning. Others need complex graphics capabilities. And others want data base inquiry for research and analysis.

"We wanted a system to improve efficiency, yet be flexible enough to handle any application we might develop. That meant an interactive DECSYSTEM-2060.

"Today, we have three 2060's supporting 200 users, performing such varied functions as data base maintenance, financial planning, production distribution, and program development.

"We're so pleased with the versatility of our DECSYSTEM-2060's, we've already ordered another one to meet our growth plans for 1980."

Charles Rossotti, President, American Management Systems, Washington, D.C.



Kornblicher, EDP Manager
orsch Consult,
unich, West Germany

Productivity.

"At Dorsch Consult, we were faced with an extremely sensitive problem. All our programs were running on a Univac operating system and obviously our programmers were comfortable with it. But, because we had to share the Univac with other customers, turn-around time was increasing and we needed more productivity.

"In our search for more computer power, we became tremendously enthusiastic with the speed and capacity of the interactive DECSYSTEM-20.

"Once we had installed one, we were truly amazed. Turn-around time was dramatically cut. We could handle lots of large programs—some with up to 50,000 statements in them.

"And finally, thanks to the TOPS-20 operating system, our programmers had very little trouble switching to the new system."

DECSYSTEM-20

B-1-14-80

The interactive computer
for the big system jobs.

☐ Please send your Interactive User Reports Brochure.
☐ Please have a sales representative contact me.

Name______________________________
Title______________________________
Company______________________________
Address______________________________
City____________________State________
Zip________Telephone________________

Send to: **Digital Equipment Corporation.**
MR1-1/M55, 200 Forest St., Marlborough,
MA 01752. Tel 617-481-9511, Ext. 6885.

digital

(Continued from In Depth/5)

circumstances is almost nonexistent.

One can hardly blame them. Try to recall your own feelings when you were writing your first program. The exhilaration of working in an exciting new field is combined with the insecurity of wondering whether you understood what you were supposed to do in the first place.

If your manager insists on being present at some of the walkthroughs (and some managers will — particularly at the beginning of the project), try to invite him when the presenter is an experienced designer/analyst with a few years of end-user interaction under his belt. With that sort of background, he is more able to accept critical observations without having his psyche reduced to quivering jelly.

One more responsibility remains for the presenter before the walkthrough. He must furnish copies of the product to the potential reviewers. The copies should be distributed at least two days prior to the meeting. This will allow the reviewers to study the document at their convenience.

Postsession Review

The presenter's responsibilities do not end with the termination of the walkthrough sesison. He reviews all of the suggestions and criticisms presented during the walkthrough. He uses them to modify and improve his product. Finally, he informs all of those who were present at the walkthrough of how he resolved each question.

During the course of our project, we developed the following procedure. The scribe/secretary gave the presenter a written list of questions that came up during the meeting. The presenter resolved each question. After the decisions had been implemented, the presenter distributed a modified copy of the design or program document.

Although this process seems to be time-consuming, it enabled us to remember all critical points. It also provided everyone with an up-to-date copy of the document that had been reviewed. Since modifications took place on a daily basis, this procedure forced us to keep each other aware of changes as they occurred.

The result was an increase in project control and a better comprehension of all system components by all members of the project team.

The second role is played by the coordinator. He is responsible for all organizational decisions in any walkthrough. The coordinator soothes tempers, keeps the meeting moving, avoids letting the reviewers' comments meander away from the product under discussion and ensures that the walkthrough proceeds smoothly. If this sounds as though the coordinator is a combination of super-administrator, super-politician and super-mother, then I've painted an accurate picture.

When we decided to go with the walkthrough process, it was agreed that each person on the team would take his turn in all of the roles. This meant that each of us served as presenter, coordinator, scribe and reviewer. Although this decision provided us with the chance to experiment, it also resulted in several disastrous sessions. An analysis of the coordinator's responsibilities will explain why this happened.

The coordinator is selected by the presenter. He then decides on a meeting time and place that will be acceptable to all who will attend.

To illustrate one of the problems that can arise during this apparently simple procedure, one of the end users on our development project provided a classic example. Since he had a very tight schedule, multiple telephone calls over several days' time were often necessary before one could even get through to him. Yet, his attendance at the design walkthroughs was of primary importance. It became necessary for everyone involved to adjust their own schedules to fit his.

Conference rooms, as is often the case, were at a premium. In order to secure a room that would comfortably accommodate six people and their paraphernalia, it was usually necessary to make a reservation three to four days in advance.

These constraints, combined with the day-to-day scheduling changes engendered by vacations, sick days and personal holidays, resulted in a logistical nightmare.

The coordinator had to cope with all of this successfully. The requirements for this phase of his role were dogged persistence, an extreme fondness for the telephone and absolutely no embarrassment about reminding people where and when to show up.

Coordinator as Mediator

During the walkthrough, the coordinator must keep conflicts to a minimum. One of our meetings provided an excellent illustration of the need for this requirement.

A representative from the Software Support Group was invited to attend a walkthrough where the product being presented was the program that would initialize the system's data base. Although this employee had not been present at any of the previous walkthroughs and had not taken the time to familiarize himself with the basic system requirements, he immediately informed the presenter that the program was totally inefficient because the file to be initialized consisted of variable-length records.

The presenter had followed specifications. She was not responsible for the file's design. However, she was forced into a defensive position from which she had to be rescued by the coordinator. If the coordinator had not stepped in to explain the reasons for the decision to use variable-length record, the meeting would probably have degenerated into a shouting match rather than a professional critique.

Once the software technician had accepted the constraints of the file design, the program was pronounced acceptable as written.

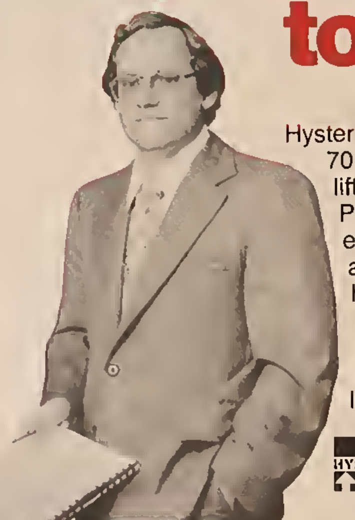
On another occasion, one where I was coordinator, an end user showed up for the walkthrough immediately after attending an unrelated and very unsatisfactory meeting. He was naturally in a negative frame of mind. This attitude carried over into our review.

The result was an apparent determination on his part to pick to pieces a portion of the design with which he had been directly involved. Although he had agreed with the design concept right up to the day of the walkthrough, it suddenly became "all

(Continued from In Depth/12)

DOS
CONVERTS DOS COBOL AND JCL TO OS
FOCUS
AUTOMATICALLY QUICKLY
ACCURATELY INEXPENSIVELY
OS
ARKAY COMPUTER INC.
24 MANOR HOUSE ROAD
NEWTON, MA 02159
(617) 964-1894

"Hyster Company reduced parts shortages to less than half of one per cent!"



Hyster Company uses 30,000 standard part numbers and 70,000 bill-of-material records in the manufacturing of lift trucks, straddle carriers, and towing winches at their Portland, Oregon plant. Yet, inventory has been reduced by over 85%, compared to what it could have been as sales have increased. Lead time from the plant has been cut by 63%.

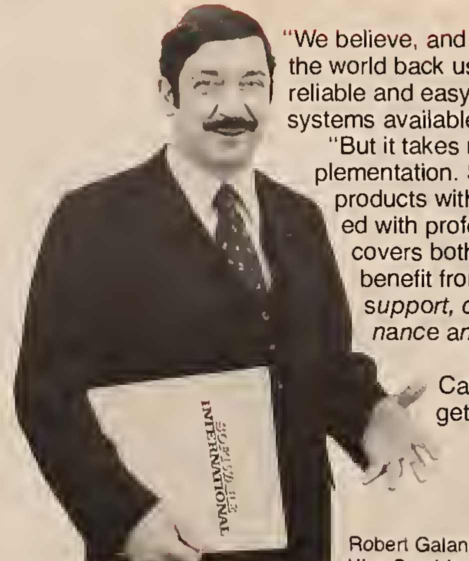
Hyster Company's secret? A strong implementation program using the Net Change MRP software package from Software International. That's getting a lot more inventory control for their software dollar.

James G. Correll,
Capacity and Material Planning Manager,
Portland Plant, Hyster Company

"Getting a real-world picture of what is happening is key to solving the manufacturing resource planning puzzle. Software International's Net Change MRP system was a key piece that has given Hyster Company exactly what they needed for their material and capacity needs. By implementing a packaged software system, Hyster Company got the flexibility to meet their own unique requirements."

Jim Jones,
Software International Manager, Manufacturing Marketing

More than software... results.



"We believe, and more than 1500 major corporations around the world back us up, that we offer the most cost-effective, reliable and easy-to-use financial and manufacturing control systems available.

"But it takes more than great systems for successful implementation. Software International supports *all* of its products with a world-wide network of local offices staffed with professionals whose wide range of experience covers both data processing and business. Users benefit from this expertise with *training, technical support, comprehensive documentation, maintenance and regular enhancements.*

It all adds up to more than just software. Call or write today, and see how easy it is to get the complete systems that achieve *results.*"

Robert Galante
Vice President Consulting & Education

General Ledger and Financial Reporting • Fixed Asset Accounting
Accounts Receivable • Accounts Payable • Net Change
Manufacturing Resource Planning • Payroll/Personnel

Get all the details about SIGMA* 2000™. It's the data-base supported system of the future, available today!

CW11460

Please tell me more about the SIGMA 2000 Manufacturing Resource Planning System. My area of interest is:
☐ Material Requirements Planning
☐ Master Production Scheduling
☐ Capacity Planning
☐ Shop Floor Control
☐ Advanced Purchasing
☐ other (please specify) ____

Name ____ Title ____
Company ____
Address ____
City ____ State ____ Zip ____
Computer System ____
Phone ____

Call Today!
Atlanta (404) 252-9880
Boston (617) 683-2447
Chicago (312) 298-3500
Columbus, OH (614) 773-2167
Houston (713) 444-3348
New York (914) 332-0040
San Jose (408) 240-7501
Toronto (416) 862-0521

SOFTWARE INTERNATIONAL
Elm Square, Andover, Mass. 01810 (617) 475-5040
*Software International Generalized Manufacturing Applications

UP YOUR PERFORMANCE
with the
EDP PERFORMANCE REVIEW

A monthly review of techniques and methods, products, literature and services to help EDP management achieve maximum productivity.

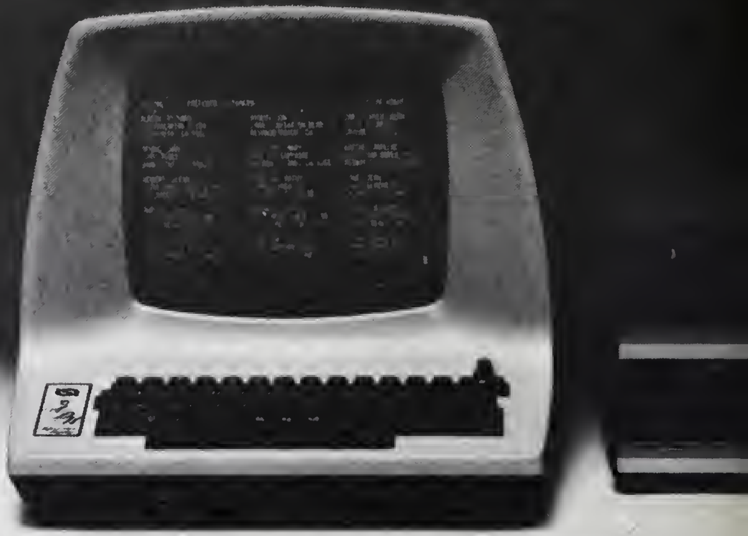
- Tutorial Reports
- Products & Services
- Current Literature
- User Experiences

Subscription: $48.00/year
Write now for a free sample issue and index.

Applied Computer Research
P. O. Box 9280
Phoenix, AZ 85068
(602-995-5929)

SOPHISTICATED GRAPHICS TERMINAL

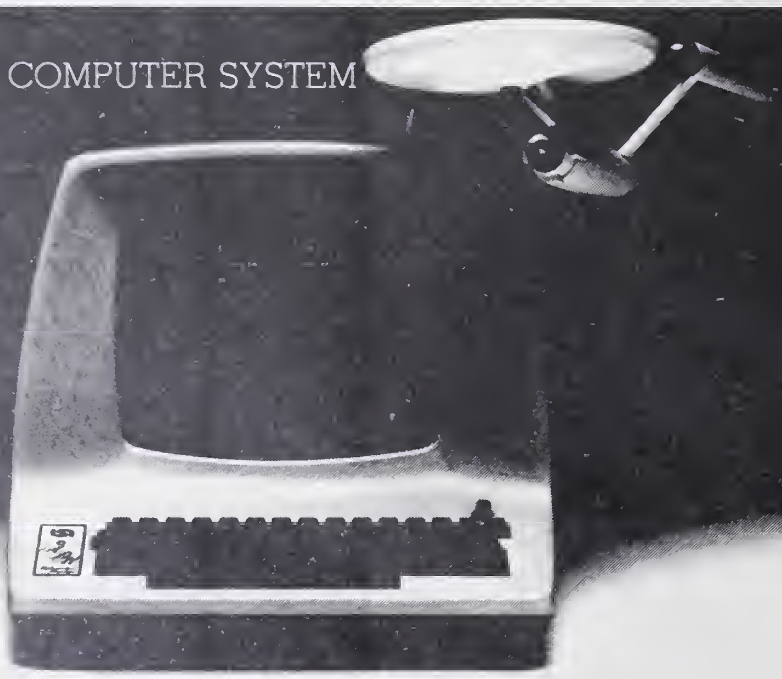
SMALL BUSINESS SYSTEM



INVENTORY CONTROL

PORTABLE I/O DEVICE

HOME COMPUTER SYSTEM



VERSATILE DATA TERMINAL

What could anyone possibly do with 85,000 Dumb Terminals®?

That's how many ADM-3A's there are out in the field working right now. And more being shipped each day. Now just what accounts for such remarkable popularity?

Sure, it's the definitive dumb terminal, adaptable enough to fit a host of applications. It has a 12-inch diagonal screen. Full or half duplex operation at 11 selectable data rates. 1920 easy-to-read characters in 24 rows of 80 letters. 59 entry keys. An RS232C interface extension port. And direct cursor addressing.

But we wondered if all 85,000 Dumb Terminals were being used for just everyday data entry. So we checked around.

And found that people are using Dumb Terminals for things even we never thought of.

THE ADM-3A GOES INTO BUSINESS.

More and more OEM's are putting the Dumb Terminal into small business systems. They assemble a package that usually contains a disk, memory, a printer, and a video display terminal — the adaptable ADM-3A.

So the chances are that when you buy a small business system from someone, it'll contain, you guessed it, the amazing Dumb Terminal.

IT TAKES STOCK OF THE SITUATION.

Many businesses are using the Dumb Terminal, along with a light pen (Universal Product Code Decoder), to keep track of their inventory. The decoder is interfaced to the Dumb Terminal, and when a piece of merchandise imprinted with a Universal Product Code passes under it, the item is entered into a computer for tallying.

Simultaneously, the item is also displayed on the ADM-3A's screen — so it's instantly available for quick double-checking.

PROGRAMMERS LIKE IT, TOO.

Surprisingly enough, many computer programmers use the ADM-3A as an effective, portable I/O device. They can take it into a back room or, along with an acoustic coupler, to their homes if they wish, and compile programs nearly anywhere.

By using telephone lines, they can have direct access to a computer. Or, with the addition of an inexpensive cassette, the programmer can store the program on tape and enter it into the mainframe at a later date — with no loss of data.

THE DUMB TERMINAL PUTS ON A NEW FACE.

Some of our more ambitious customers have transformed their ADM-3A's into sophisticated graphics terminals. Simply by installing another PCB, they've enabled their terminals to perform complex plotting, graphics, and even draw charts.

And the Dumb Terminal is so adaptable that these industrious people had no trouble with installation — the graphics PCB required not the slightest cutting or soldering. It simply slipped right in and started working, all in a matter of minutes.

YOU CAN EVEN TAKE IT HOME TO MEET THE FAMILY.

We discovered that many computer buffs are using the Dumb Terminal as an inexpensive way to upgrade their systems. After all, the equipment found on most microcomputers leaves a lot to be desired. Such as the tiny five or six-inch screen, for instance.

By upgrading to the ADM-3A, they get a full 12-inch screen that's easy on the eyes. Not to mention a lot of capabilities they wanted, but just didn't get on their systems.

All for only $895.

THE DUMB TERMINAL. THE HALLMARK OF VERSATILITY.

When you get right down to it, the Dumb Terminal's applications are pretty amazing.

It can be interfaced with a staggering variety of RS232 devices. Such as cassettes, disks, floppy disk drives, printers, paper tapes, and readers, to mention just a few.

In fact, the ADM-3A is compatible with just about any RS232 device you can name. Even other video terminals, if you wish.

And people call this a "dumb" terminal?

WHAT WILL THEY THINK OF NEXT?

Who knows? But it seems that as long as there are Dumb Terminals, people will find new, unsuspected uses for them.

Of course, the ADM-3A will continue to be the same dependable data entry terminal that's made it an industry legend.

With good, reliable features and a minimum of frills. Nothing could change that. The fact is, we think that's probably the main reason that so many people have come up with so many uses for the ADM-3A.

Who said you can't teach a Dumb Terminal new tricks?

Lear Siegler, Inc./Data Products Division, 714 N. Brookhurst Street, Anaheim, CA 92803. (800) 854-3805. In California (714) 774-1010. TWX: 910-591-1157. Telex: 65-5444. Regional Sales Offices: San Francisco (408) 263-0506. Los Angeles (213) 454-9941. Chicago (312) 279-5250. Houston (713) 780-2585. Philadelphia (215) 968-0112. New York (212) 594-6762. Boston (617) 423-1510. Washington, D.C. (301) 459-1826. England (4867) 80666.

DUMB TERMINAL SMART BUY

LEAR SIEGLER, INC.
DATA PRODUCTS DIVISION

Dumb Terminal® terminal is a registered trademark of Lear Siegler, Data Products Division

(Continued from In Depth/9)

wrong." I spent the entire meeting acting as a buffer between his unpleasant sallies and the shocked designer/analyst who had been under the impression that things were going well.

After 45 minutes had been wasted, I suggested that we adjourn the meeting and scheduled another walkthrough for two days later. At the second session, although very few modifications had been made to the original design, the end user accepted it without reservation.

I should have terminated the session at least 30 minutes earlier. Under the circumstances, any excuse would have been sufficient. The coordinator must be responsive to the emotional climate of the walkthrough. It's always preferable to end the session before egos are bruised and tempers flare.

Based upon these experiences, I would suggest that not everyone on the project will be emotionally or professionally suited to the coordinator role. A better approach might be to let people volunteer for this responsibility. The type of person who will function well as the coordinator is often the same person who will offer to take over this role.

After the walkthrough, Yourdon assigns to the coordinator the responsibility for delivering a copy of the suggestions and comments to the presenter for his review. We found it more practical to have the secretary/scribe handle this task. He is, after all, the person who generates the written record of the walkthrough session.

Yourdon also recommends that the coordinator submit a management summary to the project manager. This summary is a document stating "what was reviewed, when the walkthrough took place, who attended the walkthrough and what the verdict was."

We chose not to generate this document. It was not required by company management and was regarded as superfluous. The only item of information that might have been useful to management and wasn't already being recorded via weekly attendance forms would have been the verdict on a product. Since we were scrupulous about informing management of any significant changes in the system design, we felt free to dispense with this document.

Least Glamorous Role

Now we come to the third, least glamorous role in the walkthrough process. This is the secretary/scribe. His main responsonbility is to take note of any questions and problems that arise during the walkthrough. One might wonder whether it would be a better use of everyone's time if this function were assigned to a department secretary or clerk. However, we decided that a person who was not familiar with programming concepts and terminology would be unable to take meaningful notes.

Since the scribe's notes provide the only formal documentation of what went on during the walkthrough, we did not feel that task should be handled by someone who might miss what was being said and not realize it. Therefore, everyone who worked on the project had a turn to serve as scribe.

Speaking from experience, I found this particular role unchallenging but somewhat interesting. When acting as the scribe, one is forced to be aware of what is going on at all times. There is no chance to daydream or momentarily drift from the topic being discussed. This enforced attention provided me with insights into several areas of the project in which I was not personally involved.

After the walkthrough, the scribe must organize his notes and deliver them to the presenter in legible form. I stress the term "legible." The presenter must be able to read those notes if he's going to be able to react to them.

Since many DP technicians regard any writing that is not program code as boring, unnecessary and frustrating, I must point out the necessity of the scribe's role being performed conscientiously. We found that too often the presenter would remember only a few of the questions asked during the meeting. The reviewers' chief concerns were their own criticisms. The coordinator is usually too involved in his own role to keep track of particular details.

Without the scribe's notes, many im-

(Continued on In Depth/19)

Three strong cases for not buying portable terminals.

They're CHESS terminal cases. And they provide you with the protection and portability you need to make your present terminals portable.

So you'll have all the advantages of a portable terminal with none of the disadvantages.

You won't be faced with the high cost of purchasing portable terminals. And that'll save you a lot of money. You won't be limiting yourself to 80 columns of printout. No worrying about the cost of thermal paper, rewriting software, adding new suppliers, risking incompatibility or sacrificing standardization.

CHESS cases are constructed of ¼" high-impact ABS black textured plastic for incredible strength without arm-stretching weight. The handles are comfortable and sturdy. The chrome-plated latches are rugged and designed for fiddle-free operation. And each case is lined with foam to insure a snug, glove-like fit.

Terminal cases you can live with.
The details.

CRT Case—Holds a coupler and a Lear Siegler ADM-3A or 31, or a coupler and a Hazeltine 1400 or 1500 series terminal.
LA-34 Case—Holds a coupler and a Digital Equipment Corporation LA-34 DECwriter IV.
TTY 43 Case—Holds a Teletype Model 43.
TTY 43 "B" Case—Holds a coupler and the Teletype Model 43, or the Teletype Model 43 friction feed unit.

Get your present terminals on the move with CHESS cases.

Call or write us today for more information.

CHESS
955 Bannock St.
Denver, CO 80204
Phone: (303) 573-5135

An art, a craft, or a necessary evil?

Hughes views software as a science

History does not reveal what musician first called his style "jazz."

Nor what baseball player first prepared to hit by swinging three bats.

Nor what systems-engineering organization first recognized software as an essential ingredient of its product line.

But one that clearly has is Hughes.

Hughes Aircraft Company's management has made a major commitment to using the technology and discipline of software engineering in its systems design and development process.

Software here is an integral part of the system. Not an afterthought.

Recognition, commitment, investment

Hughes is investing millions of dollars a year in resources for software development and production. (With our four-billion-dollar backlog of more than 1,500 high-technology electronic projects to complete, we *need* to make that kind of investment!)

More important, our software engineering population — around 1,000 as recently as 1976 — has grown to more than 2,500. And is still growing. We'd like it to grow even faster.

Software specialists are a distinct and recognized element of the mainstream at Hughes. They are integrated in our engineering environment. But not swallowed up.

Software, not a sensor, is increasingly the key element in systems we are developing and delivering.

Our in-house software engineering capability is more and more often the key ingredient that keeps us ahead of competition.

We know that the software specialist is central to our scientific success and business growth at Hughes.

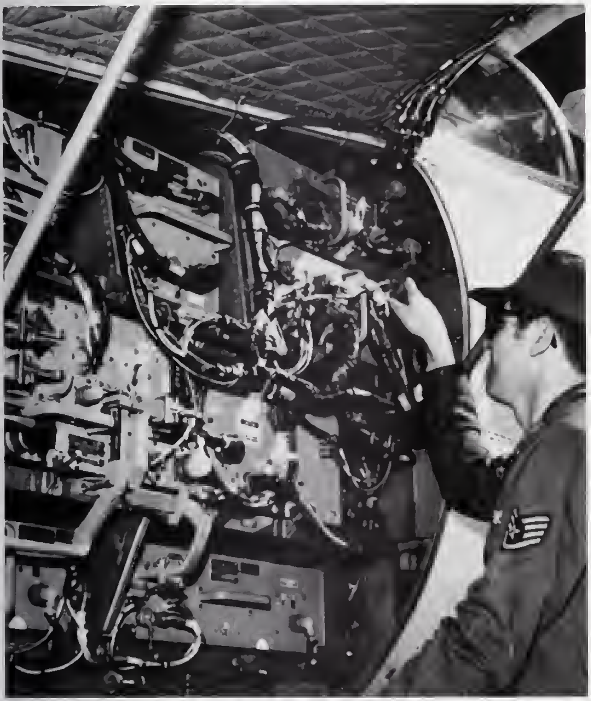
It's an interesting and rewarding place for a software specialist to work.

Come see.

Success breeds success in software at Hughes

As we repeatedly demonstrate capability in software engineering, we get more and more assignments involving software as the major component from concept through performance — in space, in the air, on or under the sea, on the battlefield, or in the corporate setting.

Meanwhile, our work attracts senior people with broad software experience and talent. And we are able to keep them happy because of the variety of our assignments that use and stretch those individuals' abilities.



▲ *All-altitude, all-aspect radar for the F-15 fighter aircraft is the Hughes-developed AN/ APG-63 system of air-to-air detection, target acquisition, and tracking capability.*

Now Hughes technology is increasing that capability still further with the addition of a programmable signal-processor on board, converting the radar from hard-wired to software programmable.

This digital modification is one example of the trend from analog to digital technology in many kinds of advanced electronic systems we create.

◄
Combat Grande is the electronic air defense system Hughes developed for Spain. It integrates existing radars, such as those shown, into the automated systems with the use of radar data extractors.

More than 680,000 instructions were programmed into the system's computers. The entire nationwide network was completed on time and within budget, and the software has effectively supported intensive tests.

Earlier, Hughes created the NATO alliance's air defense system that reaches from Norway to Turkey. It is considered the largest and most complex electronic undertaking in Europe.

Every tool is close at hand

The amount of data-processing equipment available for our software specialists to use is formidable:

IBM 370-165's, 158's, 145, 115 . . .

Sigma 5, 8, and 9; DEC-10, 11-70, and 11-780's; Univac 6135; HP 3000; and too many minis to inventory . . .

Amdahl 470's, Hughes 5118M's and AN/UYK 40's, and more.

Our modern software-development environment provides simulation-modeling tools, special test-instrumentation tools, mature compiling systems for a variety of higher-order languages, tested specification languages, and state-of-the-art programming aids — all to help set the software specialist's creativity free.

Specialists in the overall

Software engineering at Hughes focuses on the development of embedded computer systems; i.e., systems in which the data-processing capability is determined by, and dedicated solely to, necessary functions of the system.

We define and design the total system: hardware (data processing, peripherals, sensors); software (operational application programs, support for built-in test equipment, fault-isolation diagnostics, system support, training and test-exercise programs); site facilities; operational plans and handbooks; training; and installation.

What does that all-round capability mean to the individual software engineer at Hughes? Total involvement. Participation alongside the systems engineer and hardware engineer in defining with the customer the system requirements. Top-down work on definition of software architecture to meet hardware and software requirements. Cooperation with the systems engineer and hardware engineer in bringing the system to operational acceptability.

Virtually every software specialist will have a choice of job opportunities in the 1980's. In some, you might seem to be a stepchild, or on a treadmill.

At Hughes, you can be a partner and a pioneer.

Please let us hear from you.

Tear out and
fill out this
HUGHES QUICK-ACTION APPLICATION
Fold it and seal it
with the glued edge
and mail it today.
Or send your resume
to the address below.

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 36324 LOS ANGELES, CA

Postage will be paid by addressee

HUGHES
HUGHES AIRCRAFT COMPANY
Professional Placement 100/C666
P.O. Box 90515, Los Angeles, CA 90009

Hughes views software as a science

HUGHES QUICK-ACTION APPLICATION

for software specialists
who have been too busy
to update their resumes.

COMPUTERWORLD

Name ______________________________

Address ______________________________

City ____________________ State ________ Zip ________

Home Phone (Area Code ______) ______________ Hours ______________

Work Phone, if it's okay to call you there (Area Code ______) ______________

Hours ______________

Education: Highest Degree ______________________________

Field ______________ University ______________

Work Objectives ______________________________

____

Current or most recent position: Title ______________________________

No. of months ________ Duties ______________________________

____

Previous Position ______________________________

____

Computers worked with: ______________________________

____

Languages used: ______________________________

____

Signature ______________________ Date ______________

Tear out, seal with glued edge, and mail this postage-free form or send your resume to the address on the other side for prompt consideration in confidence. Thank you.

AFTER FOLDING, MOISTEN THIS EDGE TO SECURE APPLICATION FOR MAILING

FOLD IN BOTH SIDE FLAPS Ⓐ BEFORE FOLDING AT Ⓑ FOLD

AND Ⓒ FOLD

FOLD IN BOTH SIDE FLAPS Ⓐ BEFORE FOLDING AT Ⓑ FOLD

AND Ⓒ FOLD

Hughes is offering secure and varied jobs in a dozen Southern California locations in Los Angeles, Orange, and San Diego Counties.

Hughes is hiring software specialists and other data-processing professionals, engineers, scientists, and technicians.

Hughes is looking for capable men and women with all kinds of experience:

SOFTWARE ENGINEERING
- Command & Data Handling
- Communication Systems
- Computer Design Development
- Computer System Development
- Digital Communications Design
- Digital Systems - Microprocessors
- Software Design Analysis
- Software Test

PROGRAMMING
- Business Management Systems
- CAD, CAM & CAT
- Communications
- Computer Systems
- Data Processing Analysis
- Information Management Systems
- Numerical Control
- Operating System & Network
- Real-Time Graphics
- Scientific
- Software Analysis, Development & Test
- Space Power Systems

. . . and Applications Programmers familiar with radar, signal processing, air defense, tracking, missiles, or satellites.

Let us know what your technical specialty is, and how you would like to build on it.

If the Hughes Quick-Action Application originally attached to this page has been removed, please send your resume to:

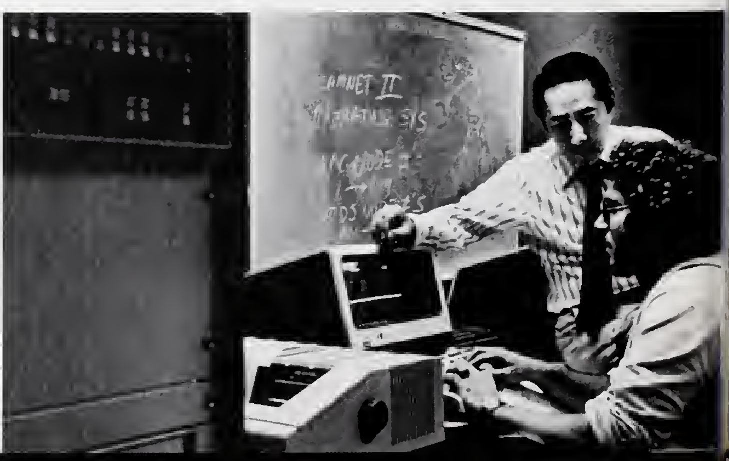
Hughes Aircraft Company
Professional Placement 100/C666
P.O. Box 90515, Los Angeles, CA 90009

HUGHES

HUGHES AIRCRAFT COMPANY

Equal Opportunity M/F/HC Employer
U.S. citizenship required for most positions

Massive data compression, interactive graphics, an integrated computer network, and 3 1/2 million computer instructions are components of the Hughes Large-Scale Real-Time Data-Processing System.



(Continued from In Depth/12)

portant questions can go unresolved. The value of the walkthrough can be considerably diminished if the importance of this role is not recognized.

Reviewer's Function

The last role to be discussed is that of the reviewer. As mentioned previously, the number and identity of the reviewers will vary. The primary responsibility for the reviewer before the walkthrough is to study the product and write down any questions or comments that occur to him. Yourdon stresses that if one feels that "he will be unable to devote enough time to review the product, it is better that he not participate rather than performing a superficial review."

It is unfair to all participants if the reviewer has not looked at the document before the walkthrough session. Time is wasted when unnecessary questions are raised. If one agrees to participate as a reviewer, one has made a commitment to the project.

During the walkthrough, the reviewer presents his critique. Remember that comments are directed to the product rather than the presenter. Personal pronouns are to be avoided. Reviewers should be as objective as possible.

Arguments about the "best" way to solve a problem have no place in the walkthrough session. The purpose of the walkthrough is error detection. The most efficient way to correct these errors should be determined later.

Personal criticism is anathema to a successful walkthrough. Keep in mind that it is uncomfortable to have one's peers searching through one's work for mistakes. Remember that professional consideration and courtesy are due your fellow technicians.

After the walkthrough, the reviewer must read the presenter's resolution of all questions. The presenter may have accepted the suggestions. He may have decided that a change to the product was not warranted. If the reviewer is an end user of the system, then all questions should be resolved in such a way as to fulfill the user-specified system requirements.

When reviewing program code, don't forget that coding practices vary on an individual basis. Yourdon suggests that questions about coding techniques should be settled by referring to installation or project standards. Even within these standards, personal programming preferences become obvious.

There is probably always one best way to solve a problem, but there may be nine other methods that work almost as well. I don't know of many DP departments where the technicians have the time to review all possible alternatives and decide upon the most efficient and elegant programming techniques.

Keep personal quirks out of discussions about program code. If the presenter decides to ignore your suggestions and if this program will work correctly as it is written, the subject should be dropped.

After using the structured walkthrough approach for the development of a large-scale computer application, I've considered the question of whether this technique is a viable one. It certainly improves the communication between all members of a project team. The analysts know what the programmers are doing. The programmers gain a better understanding of the overall system design. There is less chance that undiscovered holes in the system design will emerge two weeks before the implementation date.

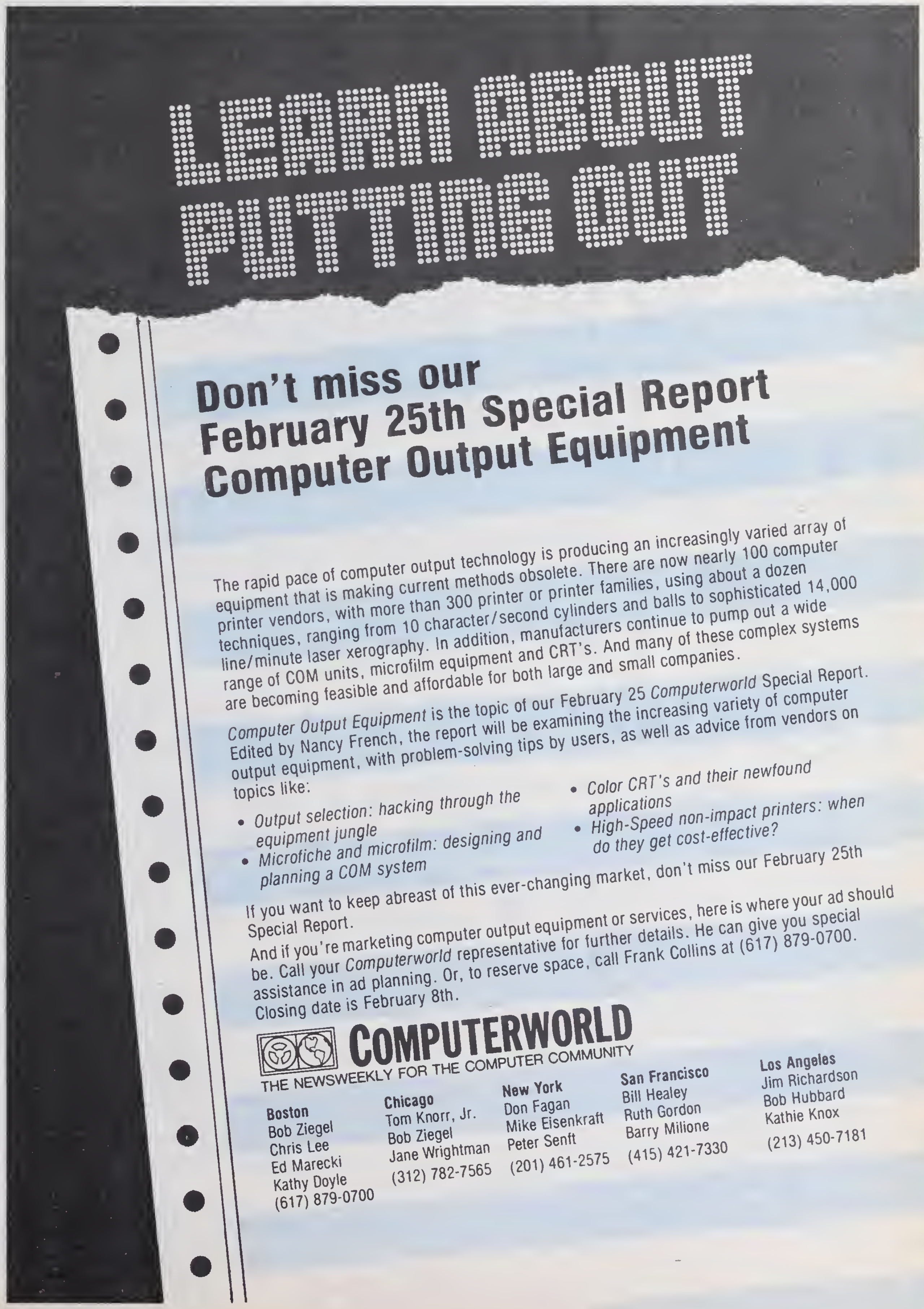
The peer group review encourages us to turn out a better product. There is nothing like the prospect of having your errors pointed out in front of other people to increase your motivation to do a good job.

This method also improves communication between the project team and the end user. He becomes a recognized contributor to the system design. Obscure jargon is not acceptable at a walkthrough session. Therefore, the end user feels free to ask questions without the fear of appearing foolish before the technical group. This interaction inevitably increases the technicians' knowledge of the application with which they are working.

Handling Problems

The walkthrough technique also has some less positive effects. We have already discussed the ego problems that

(Continued on In Depth/20)



Don't miss our February 25th Special Report Computer Output Equipment

The rapid pace of computer output technology is producing an increasingly varied array of equipment that is making current methods obsolete. There are now nearly 100 computer printer vendors, with more than 300 printer or printer families, using about a dozen techniques, ranging from 10 character/second cylinders and balls to sophisticated 14,000 line/minute laser xerography. In addition, manufacturers continue to pump out a wide range of COM units, microfilm equipment and CRT's. And many of these complex systems are becoming feasible and affordable for both large and small companies.

Computer Output Equipment is the topic of our February 25 *Computerworld* Special Report. Edited by Nancy French, the report will be examining the increasing variety of computer output equipment, with problem-solving tips by users, as well as advice from vendors on topics like:

- *Output selection: hacking through the equipment jungle*
- *Microfiche and microfilm: designing and planning a COM system*
- *Color CRT's and their newfound applications*
- *High-Speed non-impact printers: when do they get cost-effective?*

If you want to keep abreast of this ever-changing market, don't miss our February 25th Special Report.

And if you're marketing computer output equipment or services, here is where your ad should be. Call your *Computerworld* representative for further details. He can give you special assistance in ad planning. Or, to reserve space, call Frank Collins at (617) 879-0700. Closing date is February 8th.

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Boston
Bob Ziegel
Chris Lee
Ed Marecki
Kathy Doyle
(617) 879-0700

Chicago
Tom Knorr, Jr.
Bob Ziegel
Jane Wrightman
(312) 782-7565

New York
Don Fagan
Mike Eisenkraft
Peter Senft
(201) 461-2575

San Francisco
Bill Healey
Ruth Gordon
Barry Milione
(415) 421-7330

Los Angeles
Jim Richardson
Bob Hubbard
Kathie Knox
(213) 450-7181

(Continued from In Depth/19)

can emerge when a person knows his errors are going to be publicly discussed. We never discovered a satisfactory method of handling the obnoxious technical whiz who attended several walkthroughs, criticized the document with complete insensitivity to the hurt feelings he was causing and was also invariably correct in his comments and criticisms.

Familiarizing your entire staff with the walkthrough technique might alleviate this problem. Don't just spring it on them. Formal classes as to how to conduct a walkthrough are available. It is well worth the time and money required to attend them.

The walkthrough also gives the impression of being extremely time-consuming. This may not be true. Although the time we spent in reviewing program code and system design was measurable, the time we saved in producing a system that will require relatively little maintenance and contain few errors is a nebulous quantity.

At this point, it is too soon to gather enough data to determine whether walkthroughs are cost-justified on a money/time basis. The best approach is to utilize this technique flexibly. The walkthrough is very useful when reviewing an analysis or design document. The problems that crop up when reviewing program code make the walkthrough less attractive.

In addition to differences in individual technique (and programmers will argue in favor of their own methods for hours on end to no useful purpose), there is a major time commitment required from several project members if one is to review the code thoroughly. If we had held to the recommended 50 to 100 lines of code during our walkthrough sessions, the amount of time required would have been unacceptable to management. We would also have had to significantly alter our projected completion date.

Flexibility is the key to using the walkthrough so that it is most beneficial to your organization. Enforce the recommended guidelines judiciously and in a way that best fits your departmental structure. If you do, the structured walkthrough can be of real benefit in developing your next computer system application.

Rita Shoor is a principal in Shoor and Associates, a data processing consulting firm in Evanston, Ill.

Before starting her own firm in 1976, Shoor worked as a technical representative for Applied Information Development, a Midwestern DP consulting firm, where she was responsible for all phases of system design and analysis, programming and implementation.

Shoor began her career in 1970 with Kemper Insurance Co. in Long Grove, Ill., progressing from programmer trainee to senior programmer. Later she worked as a project leader at the Northern Trust Bank in Chicago.

Shoor holds a B.A. degree from DePaul University and is currently doing research for a book to explain the human side of programmers to the public.

NOW THE COMPATIBLE CHOICE IN COMPUTERS OFFERS A COMPATIBLE CHOICE IN SOFTWARE EDUCATION.

When Amdahl designed the industry's most advanced large-scale computers, one of our goals was complete software compatibility with IBM. Amdahl 470 series computers use the same software as IBM large-scale systems.

We established the Amdahl Education Center to help customers learn about the most current developments in compatible software. Amdahl offers a select set of courses that reflect the needs of customers. Each course provides intensive, in-depth, advanced software training to our own staff software specialists and our customers. In addition, many of the professionals that profit from our education programs are from IBM installations.

The Amdahl Education Center offers an extensive selection of courses, year-round, in Sunnyvale, California, and in Columbia, Maryland. For course descriptions, class schedules, and registration forms, write: Amdahl Education Center, Dept. C, 1250 East Arques Avenue, P.O. Box 470, Sunnyvale, California 94086. Or call: 408/746-6393.

Make the compatible choice in computers your choice in software education.

amdahl

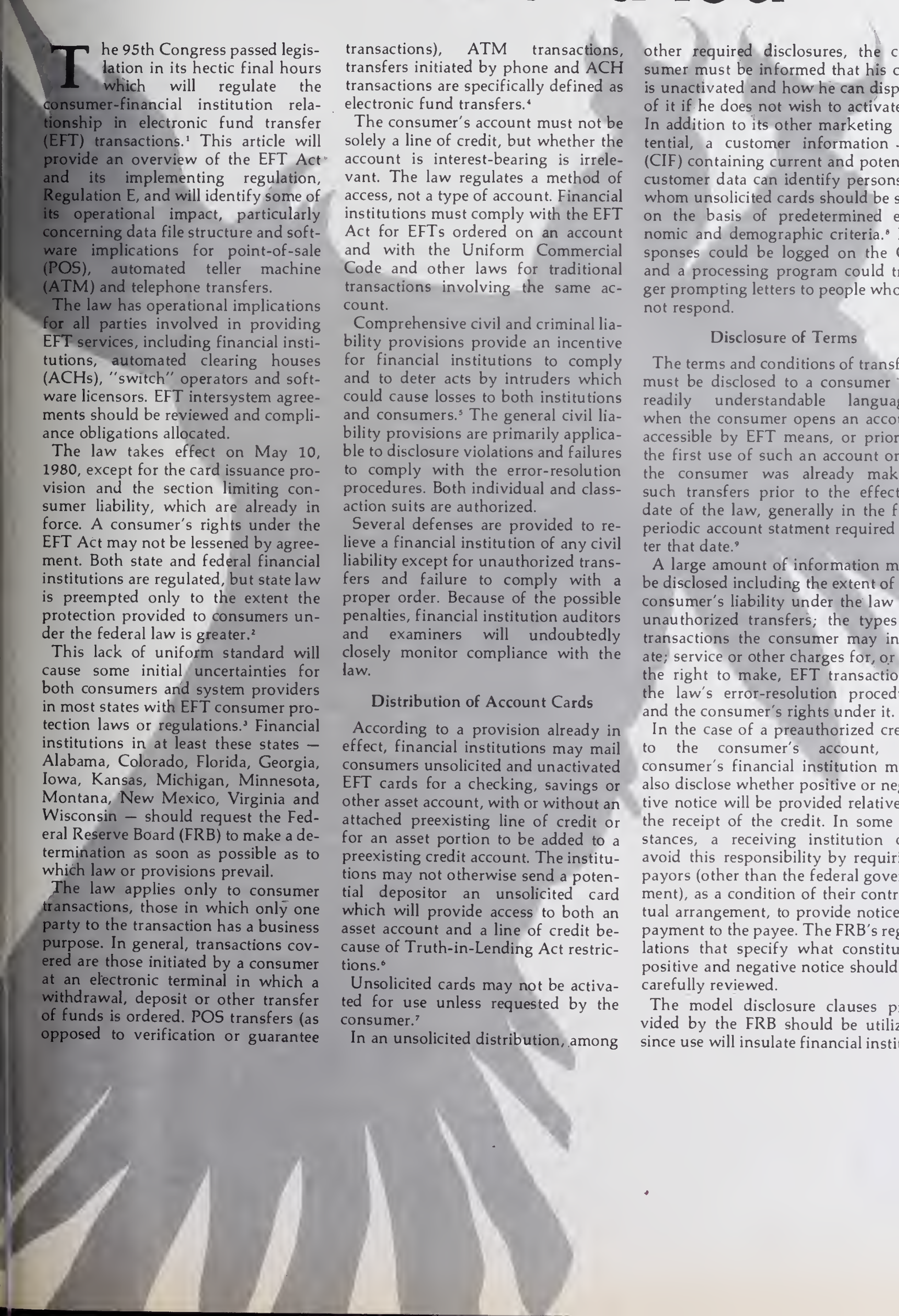
AKD VOLUME DATA ENTRY SERVICES
HOTLINE
for INSTANT QUOTES
• Omaha
(800) 228-9410
AMERICAN KEY DATA
Mid America Plaza, Suite 144
7171 Mercy Rd., Omaha, Ne. 68106

The Electronic Fund Transfer Act is coming. The federal law will impact EFT network users in several key areas.

Are you ready?

EFT: The Law and You

By Fred Greguras



The 95th Congress passed legislation in its hectic final hours which will regulate the consumer-financial institution relationship in electronic fund transfer (EFT) transactions.[1] This article will provide an overview of the EFT Act and its implementing regulation, Regulation E, and will identify some of its operational impact, particularly concerning data file structure and software implications for point-of-sale (POS), automated teller machine (ATM) and telephone transfers.

The law has operational implications for all parties involved in providing EFT services, including financial institutions, automated clearing houses (ACHs), "switch" operators and software licensors. EFT intersystem agreements should be reviewed and compliance obligations allocated.

The law takes effect on May 10, 1980, except for the card issuance provision and the section limiting consumer liability, which are already in force. A consumer's rights under the EFT Act may not be lessened by agreement. Both state and federal financial institutions are regulated, but state law is preempted only to the extent the protection provided to consumers under the federal law is greater.[2]

This lack of uniform standard will cause some initial uncertainties for both consumers and system providers in most states with EFT consumer protection laws or regulations.[3] Financial institutions in at least these states — Alabama, Colorado, Florida, Georgia, Iowa, Kansas, Michigan, Minnesota, Montana, New Mexico, Virginia and Wisconsin — should request the Federal Reserve Board (FRB) to make a determination as soon as possible as to which law or provisions prevail.

The law applies only to consumer transactions, those in which only one party to the transaction has a business purpose. In general, transactions covered are those initiated by a consumer at an electronic terminal in which a withdrawal, deposit or other transfer of funds is ordered. POS transfers (as opposed to verification or guarantee transactions), ATM transactions, transfers initiated by phone and ACH transactions are specifically defined as electronic fund transfers.[4]

The consumer's account must not be solely a line of credit, but whether the account is interest-bearing is irrelevant. The law regulates a method of access, not a type of account. Financial institutions must comply with the EFT Act for EFTs ordered on an account and with the Uniform Commercial Code and other laws for traditional transactions involving the same account.

Comprehensive civil and criminal liability provisions provide an incentive for financial institutions to comply and to deter acts by intruders which could cause losses to both institutions and consumers.[5] The general civil liability provisions are primarily applicable to disclosure violations and failures to comply with the error-resolution procedures. Both individual and class-action suits are authorized.

Several defenses are provided to relieve a financial institution of any civil liability except for unauthorized transfers and failure to comply with a proper order. Because of the possible penalties, financial institution auditors and examiners will undoubtedly closely monitor compliance with the law.

Distribution of Account Cards

According to a provision already in effect, financial institutions may mail consumers unsolicited and unactivated EFT cards for a checking, savings or other asset account, with or without an attached preexisting line of credit or for an asset portion to be added to a preexisting credit account. The institutions may not otherwise send a potential depositor an unsolicited card which will provide access to both an asset account and a line of credit because of Truth-in-Lending Act restrictions.[6]

Unsolicited cards may not be activated for use unless requested by the consumer.[7]

In an unsolicited distribution, among other required disclosures, the consumer must be informed that his card is unactivated and how he can dispose of it if he does not wish to activate it. In addition to its other marketing potential, a customer information file (CIF) containing current and potential customer data can identify persons to whom unsolicited cards should be sent on the basis of predetermined economic and demographic criteria.[8] Responses could be logged on the CIF and a processing program could trigger prompting letters to people who do not respond.

Disclosure of Terms

The terms and conditions of transfers must be disclosed to a consumer "in readily understandable language" when the consumer opens an account accessible by EFT means, or prior to the first use of such an account or, if the consumer was already making such transfers prior to the effective date of the law, generally in the first periodic account statment required after that date.[9]

A large amount of information must be disclosed including the extent of the consumer's liability under the law for unauthorized transfers; the types of transactions the consumer may initiate; service or other charges for, or for the right to make, EFT transactions; the law's error-resolution procedure and the consumer's rights under it.

In the case of a preauthorized credit to the consumer's account, the consumer's financial institution must also disclose whether positive or negative notice will be provided relative to the receipt of the credit. In some instances, a receiving institution can avoid this responsibility by requiring payors (other than the federal government), as a condition of their contractual arrangement, to provide notice of payment to the payee. The FRB's regulations that specify what constitutes positive and negative notice should be carefully reviewed.

The model disclosure clauses provided by the FRB should be utilized since use will insulate financial institutions from any liability for failure to make full disclosure. Only the disclosure of the error-resolution procedures and rights must be repeated on an annual basis.

Transaction Documentation

A receipt which enables the consumer to later recall the transfer described must be made available at the time of each EFT initiated at ATMs, cash dispensers and other terminals.[10] The information required in a receipt, whether printed or written, includes the type, amount and date of transaction; the identity of the consumer's account for or to which funds are transferred; the identity of any third party to whom or from whom funds are transferred; and the location or identification of the electronic terminal involved in making the transaction.

Transactions initiated by telephone need only be reflected on the account statement. This statement must describe all EFTs by the same identifying elements as does a receipt. Hence, all this information must be part of a consumer's transaction record and has to be captured in some manner as transfers occur.[11]

A statement must be provided for each consumer account on a monthly basis if a transfer which affects that account occurred during the month, or only every three months in the event no EFT activity occurs in any month during that interval, or if the only activity is preauthorized credits. The law does not specify how soon the statement must be furnished after the end of the period it covers.

CIF record structure and processing software should be designed to trigger statements on the basis of the specified events. Financial institutions that allow EFT access to savings accounts will have to provide an account statement on a monthly basis rather than only quarterly. Charges associated with EFT transactions must be separated from other charges for utilizing an account since transaction and mainte-

(Continued on In Depth/22)

(Continued from In Depth/21)

nance cost for EFT purposes during the specified period must be disclosed.

The account statement may combine traditional and EFT transactions involving the same account. Thus, the trend of producing a single statement from a CIF which encompasses all forms of transactions and accounts may continue.

Liability for Unauthorized Transfers

The provision regarding liability for unauthorized transfers is presently in force.[12] It is the most ambiguous section and the most confounding when the limited federal preemption provision is considered. Counsel in Alabama, Colorado, Florida, Iowa, Kansas, Michigan, Minnesota, Montana, New Mexico, Virginia and Wisconsin should be particularly attentive to this dilemma.

Congress generally adopted a loss-limitation approach rather than an allocation of risk based primarily on fault, as the National Commission on EFT recommended. A consumer has potential liability only if a method of transaction authentication such as a personal identification number (PIN) is associated with the account. PIN management methods currently offered by several vendors can minimize its vulnerability.

In the case of an unsolicited account card, a consumer has no liability until the means of account access is activated at the consumer's request. When a card has been requested, the consumer bears no risk until he receives the card and signs or uses it. If a loss is caused by an intruder, such as through a simulated or intercepted wire communication or through an account card fraudulently obtained from the account holder's financial institution, the FRB has interpreted the law to mean that a consumer has no liability or duty under any circumstances to prevent further loss in such situations.

If no fraud is involved and a consumer reports a lost or missing card within two business days after learning of the situation, he is liable for losses caused by unauthorized transfers only to the lesser of $50 of the total loss or the total loss at the time the financial institution is notified of the missing card. The wording of the law appeared to allocate loss on a transactional basis, but the FRB interpreted the limitation as applying to total account losses.

If the consumer waits for more than two business days to report his missing card, his potential exposure is $500 if the loss could have been avoided by prompter notice. If the consumer fails to report an unauthorized transfer within 60 days after it appears on his account statement, his potential liability is unlimited but only with respect to additional losses from unauthorized transfers which occur subsequent to the 60-day period and only to the extent notice within the period would have avoided the loss.[13] All three tiers of liability can apply to a series of unauthorized transfers involving a compromised card.

Institution's Risk

Once the consumer provides notice of a compromised card or other access device, the risk of further loss shifts to the financial institution. The FRB initially encouraged consumers to provide prompt notice by telephone by specifying that written notice was not effective until received by the financial institution. However, the FRB reacted to the vocal pressure of Rep. Frank Annunzio (D-Ill.) and has adopted a new definition of notice which makes notice effective at the time of mailing, not delivery.

File record structures and data base management system software must allow on-demand "flagging" of a specific card or complete account to indicate that EFT transactions are no longer authorized on them, and processing software must check for authorization as EFT transactions are ordered.

EFT system software should log attempted transactions in which proper authentication is not provided, similar to the manner in which unsuccessful log-on attempts are often logged in a time-sharing environment. These logs should be reviewed regularly to identify possible fraudulent activity.

Where a manned terminal is involved and a transaction is not properly authenticated or the card presented has been reported as stolen, the system can be designed to send messages to the terminal operator to take certain action such as calling the police or merely not returning the card. An ATM can also be designed to not return an account access card in such situations.

To avoid liability, a financial institution must prove the transaction was authorized or, if it was unauthorized, must demonstrate both that the institution's various duties were met and the amount, if any, of the consumer's liability.[14] The consumer can always sue his financial institu-

INFONATIONAL®

INFONATIONAL® systems are a group of comprehensive, easy-to-use, highly flexible, fully integrated business and financial accounting software packages. They are designed specifically to report timely and accurate financial information to management in on-line or batch modes.

UCS

General Ledger
The General Ledger furnishes information required to manage day-to-day operations, as well as information needed to make sound business decisions about the future. The General Ledger also includes a comprehensive budgeting module. And a powerful report writer satisfies any reporting requirement.

Accounts Payable & Purchase Order
This module generates a full series of distribution, disbursement, and cash requirement reports, standard cost variance reports, automatic calculation of discount and due date reports to control the payable process. A flexible report writer is also available. In addition, the Purchase Order module provides a full range of tracking, matching and reporting capabilities.

Accounts Receivable & Sales Analysis
The Accounts Receivable module helps reduce costs while maximizing profits. It allows you to determine more profitable marketing plans through expedient reporting on your product mix, by controlling collections, by optimizing cash flow, and by properly reporting sales statistics.

Fixed Assets
This module is designed to help you take advantage of the latest tax legislation. It features full transfer capabilities, investment tax credit and recapture, and many depreciation methods. In addition, the system has both an optional Asset Depreciation Range module and a flexible report writer.

FORESI

Financial Modeling
FORESIGHT asks the question, "What if . . .?," in such areas as strategic planning, cash requirement planning, capi-

tion; liability cannot be avoided by referring the consumer to other system providers.

Inter-EFT system contracts should therefore clearly specify the allocation of risk for unauthorized losses and, to the extent possible, financial institutions should procure insurance to cover such losses.[15]

The notification process associated with a lost or missing card is fraught with uncertainties and the potential for fraud. The evidentiary difficulties involved in proving "knowledge of the situation" and timing of the notice are immense.

In litigation under the new law, to establish *prima facie* evidence that a transaction occurred and to shift the burden of going forward to the financial institution, the consumer need only produce either the receipt or periodic account statement which reflects the disputed transaction.[16] If documentation is unavailable, a determination will ultimately be based on the veracity of the consumer and his witnesses versus the accuracy and reliability of the financial institution's recordkeeping system.

Financial institutions should make sure that their counsel are prepared to present the foundation evidence necessary to demonstrate the dependability of the hardware and the processing and data base management software.[17] Historically, the most common reason courts have rejected computer-based evidence is a failure to establish this general foundation of accuracy and reliability.

Liability for Failure to Comply

Although the FRB has suggested that a financial institution's liability under this provision may be lessened by agreement, it is difficult to perceive how much it could be lessened without thwarting the consumer protection purpose of the law.

A financial institution is liable to the consumer for the "proximately caused" damages[18] if it:

- Fails to make a transfer in a correct amount or in a timely manner when properly instructed to do so.
- Fails to make a transfer because of insufficient funds resulting from the failure of the institution to credit a deposit.
- Fails to stop payment on a preauthorized transfer when properly directed to do so.

Only "actual" damages proved may be recovered if the failure to perform was unintentional and the financial institution acted reasonably to prevent the error. Although these events can be caused by a poorly trained person or faulty manual procedures, the institution should thoroughly test the reliability of the communications network and computer system, the method of authentication and the accuracy of the processing programs before an EFT system goes operational. Regularly scheduled hardware maintenance and continuing exception-item testing of the software will also minimize this risk.

A financial institution is totally excused from liability only when it can demonstrate, by a preponderance of the evidence, that the event was caused "by an act of God or other circumstance beyond its control" and that it took "reasonable" precautions to prevent the occurrence and otherwise acted diligently under the circumstances.[19] However, because of the continual press coverage given contingency planning, financial institutions must be prepared to demonstrate the reasonableness (cost/benefit analysis) of their EFT system backup preparations or lack thereof.

Liability is not imposed on the financial instituion if the consumer is aware of a "technical malfunction" at the time a transfer is initiated. Manned terminal locations should be immediately notified if the system is down so that notice can be provided to potential users. The key factors in avoiding liability appear to be whether a transaction is attempted before notice is given and the existence of damage. At an ATM, this issue is the existence of damage.

Processing software should allow several attempts at providing the proper PIN from a terminal location. The number of attempts allowed is a judgment call, but existing systems appear to allow at least three tries.

The system software should log all failures to properly complete a transaction and the reasons. This will serve to identify the types and relative frequency of problems. This log should be reviewed by assigned personnel to determine whether the precautions taken are satisfactory and to identify possible perpetrators of fraudulent transactions.

The incidence of problems as weighed against the cost of additional measures to remedy them can also serve as evidence, in cases brought against the financial institution, of the reasonableness — that is, a cost/benefit

(Continued on In Depth/24)

tal budgeting, cash management and management financial reporting. FORESIGHT features: extended statistical analysis, graphics, publishable user-designed reports, self documentation, unlimited consolidations and detailed audit trails.

In addition, FORESIGHT is integrated with the INFONATIONAL General Ledger and fully supported by professional consulting and training staffs.

Industry Tested and Recognized for Excellence

FORESIGHT is used by more than 150 of the "Fortune 500" companies. It is easy to learn and use because its 60 simple English language commands are expressed in everyday business terms. It has been recognized by ICP for sales excellence and Datapro for performance.

GHT®

UCS

FORETAX®

UCS

Corporate Tax Compliance and Planning

State and federal income, franchise and municipal tax returns can be prepared by the tax department in your company with FORETAX.® And this comprehensive, user-controlled system can double as a powerful planning tool. FORETAX is fully supported by a staff of tax professionals.

Simple to Operate

Learning and using FORETAX is simple. No previous knowledge of computers is necessary and no new personnel have to be hired to operate the system.

More Technology from a Communications Leader.

The full line of systems offered by United Computing is backed by United Telecommunications.

Learn more about Infonational, Foresight and Foretax

For more information, on INFONATIONAL, FORESIGHT or FORETAX, write: Director of Marketing, Business Information Products Division, DEPT. "D," United Computing Systems, Inc., 2525 Washington, Kansas City, Missouri 64108. Or call: 816 221-9700.

CW-1080D
Name ________
Title ________
Company ________
Address ________
City ____ State ____ Zip ____
Business Information Products Division

UNITED COMPUTING SYSTEMS

UCS

People, systems and solutions United

(Continued from In Depth/23)

analysis -- of the precautions chosen.

The EFT Act's broad definition of "error" provides a consumer with a nonjudicial remedy for almost all perceived problems.[20] The procedure is mandatory only for financial institutions and is available to a consumer only if he acts within 60 days after receiving documentation of the transaction that allegedly involved an error. Consumers may choose to follow the procedure, or may pursue legal action, or both.

Speedy and equitable remedies are encouraged by requiring a financial institution to act in good faith in making determinations.[21] The issue under the procedure is whether an error exists, not who caused it.

The consumer can always demand some action from his financial institution, but Regulation E has limited a financial institution's duties in such an investigation when a third party is involved. Financial institutions must clearly require prompt assistance from other system components in inter-EFT systems contracts in order to meet these deadlines.

The initial notification, whether oral or written, triggers the financial institution's duty to investigate the alleged error, determine whether an error has occurred and report or mail the results of the investigation to the consumer within 10 business days or one business day after a determination, whichever is earlier, if the conclusion is that an error occurred. If the financial institution concludes that no error occurred, the time frame for a response is the earlier of 10 business days or three business days after the determination.

Because of the "short fuses," financial institutions must develop some systematic method of logging such requests and tracking their resolution.

If the financial institution provisionally recredits the consumer's account in the amount in dispute within a 10-business-day period, the maximum length of the investigation and determination period is extended to 45 calendar days after notification of the alleged error. However, no limitations are imposed on the consumer's use of the funds during the investigation. Thus, risks can be minimized only by developing a systematic method of providing responses within the shorter deadlines.

When a consumer orally notifies a financial institution of an alleged error, the institution may require written confirmation within 10 business days. The allowable time span for determinations runs from the point of oral notification. As presently proposed, if written confirmation is not received, the financial institution need not provisionally recredit the consumer's account, although all other duties must be met.

It will be advantageous to financial institutions to develop a timely response system rather than to regularly take the risk of provisionally recrediting an account, particularly because of the additional notice requirements which will likely be imposed upon financial institutions when they provisionally recredit and deduct funds from a consumer's account.

Since oral requests must be honored, financial institutions could be subject to a rash of ill-founded and harassing claims under the procedure. A log of consumer requests can be used to identify such recurring conduct. If no line of credit is associated with the account which the EFT card may access, credit opportunity laws and regulations would not be applicable and a financial institution may unilaterally close the account of an individual who follows such a course of conduct.

EDP

DISASTER PLAN

METHODOLOGY

Gives you what you need to implement, maintain & test a Disaster Plan - tasks, procedures and guidelines.

Learn how to develop a disaster recovery plan at our 3 day workshops:

Boston Feb. 6-8, 1980
San Fran Feb. 20-22, 1980
Wash. D.C. Mar. 24-26, 1980
Orlando, FL April 14-16, 1980

EDP Security, Inc.
400-2 Totten Pond Rd.
Waltham, MA 02154
617-890-6466

A year's experience has proved us right about Series 80 TOTAL. It's the easiest software package to learn and use . . . and improves programmer productivity.
George F. England
Information Services Manager
Imperial Tobacco Ltd.
American Leaf Organization
Imperial Group Ltd., a diversified manufacturer of consumer goods, is one of the U.K.'s largest companies.

Although both the House and Senate bills contained reversibility provisions as they were originally introduced, the arguments for reversibility were not convincing enough to allow the provisions to move out of committee. A stop-payment right was retained for preauthorized transfers, transactions in which an ACH usually plays a role.[22] Data base management systems and processing software of all EFT system components must be able to respond quickly, since a consumer may direct his financial institution to stop payment, orally or in writing, at any time up to three business days preceding the scheduled date of the transfer.

Presently, Michigan and Wisconsin laws establish a right of reversibility for certain POS payment transactions. Since such provisions are more favorable to the consumer than the federal law, other states could enact such a provision.

In my opinion, the small volume of POS transfers involving third parties, such as merchants, that have occurred to date have not totally tested the operational capability of existing EFT system software and file structure resources that support such provisions.[23] The determination procedure associated with reversal will ultimately demand more personnel resources as well since a human evaluation of a consumer's request is required prior to the computer's involvement.

The EFT Act requires only that financial institutions inform the consumer, at the time of contracting for EFT services, of the circumstances under which his EFT account information will be disclosed to third parties in the ordinary course of business. This could happen, for example, when it is necessary for completing an EFT, in order to verify the existence and condition of a consumer's account for a third party such as a credit bureau or merchant, in order to comply with governmental agency or court orders and when the consumer gives consent.[24]

No logging of releases or transfers or other affirmative requirements are established in the EFT Act. However, the Financial Privacy Act of 1978, state law and pending federal legislation support the business judgment that data file record structures and data base management systems should be implemented which limit access to specified persons and terminals and which log and monitor releases and transfers of account information.

Financial institutions contemplating participation or already participating in EFT systems in Alabama, Colorado, Iowa, Michigan, Minnesota, Montana, New Mexico, Virginia and Wisconsin should have their counsel carefully examine the respective state law to determine compliance requirements.

The compliance requirements of this law will increase the cost of offering EFT. Financial institution computer system managers and counsel should examine the impact on the cost of doing business and exposure created by the EFT Act, on the basis of the institution's specific computer and communications system configuration, processing software, file organization and data base management system.

Pending federal and state legislation concerning EFT, privacy and other matters relating to computers should be carefully monitored and meticulously examined. The operational implications of compliance with such proposals should be promptly identified by financial institutions and their relative cost and benefits communicated to legislators and regulators.

For example, a recent study by the American Bankers Association concluded that compliance costs of the legislative recommendations of the Federal Privacy Protection Study Commission would be very high. The uproar over the Financial Privacy Act notification requirement is illustrative

(Continued on In Depth/26)

SERIES 80 TOTAL®. BECAUSE YOU ONLY LOOK AS GOOD AS YOUR DATA BASE SYSTEM.

Just about every DBMS is built with the technician in mind.

Unfortunately, not many systems consider the Data Processing executive's needs. Such as, integrating the data base system into the company's system of management; applying the DBMS to produce the right information as quickly and as understandably as possible; and, most important, minimizing overall investment—in machine resources, programming time and manpower.

Series 80 TOTAL is unique because it satisfies the technician's DBMS requirements and management's needs as well.

That's because Series 80 TOTAL is built not just for why you buy a DBMS, but also for how you use it.

THE MOST USEFUL SYSTEM IS THE ONE THAT'S USED MOST.

It stands to reason that the more useful a DBMS is to management, the more they'll use it. A survey of data base users by International Data Corporation (IDC), the independent research company shows that TOTAL users integrated TOTAL into an average of 41% of all user applications.

That's more use than any other DBMS, and almost twice as much as the next leading system.

Series 80 TOTAL is used more because it's the only data base management system structured to mirror your company's system of management. So it makes sense to end users as well as Data Processsing executives. And, as business needs change, Series 80 TOTAL's modular, step by step development capabilities are flexible enough to be adapted to change, quickly and inexpensively.

You can add new data, new functions, new applications modularly, step by step, without having to scrap, update, maintain or rewrite a dozen programs for every new one you add.

ALL THE FEATURES NEEDED FOR SUCCESS.

No wonder when IDC asked users what they'd like to see changed about their particular package, Series 80 TOTAL was the only one of the three leading systems to receive a clean bill of health.

Many new features and facilities that have made Series 80 TOTAL a success come from the experiences of more than 2,000 users who, over the last decade, have used TOTAL in almost half their applications.

The end result is a DBMS whose architecture is conceived to accommodate distributed processing, data base machines, even migration to the new IBM 4300 (because it supports VSAM) and TIS, Cincom's revolutionary new Total Information System.

But don't take our word for it. Take the word of the users IDC surveyed.

Fill in the coupon below or call Dennis Yablonsky our national sales manager at (513) 662-2300, and we'll review all the pertinent details of the IDC study. We'll show you how Series 80 TOTAL looks as good on the job as other systems look on paper.

Contact us now. Because how well your data base system succeeds at its job may very likely determine how well you succeed at yours.

Please bring me proof of why Series 80 TOTAL outperforms the competition.

Name ________ Title ________

Company ________

Address ________

City State ________ Zip ________

Mail to: **U.S.A.:** Department D.C.
Cincom Systems, Inc., 2300 Montana Ave.,
Cincinnati, Ohio 45211, (513) 662-2300
International: Cincom Systems International,
17-19 Rue Montoyer, 1040 Brussels, Belgium,
(02) 511-6548

Cincom Systems, Inc.
Systems Software Division

READ NCR CASSETTES INTO YOUR MAINFRAME
ON SITE
OR VIA
TELECOMMUNICATIONS
call or write
COMMERCIAL DATA PROC., INC.
2241 S. Grand Blvd.
St. Louis, Mo. 63104
(314) 776-1130

(Continued from In Depth/25)

of the need to scrutinize such proposals prior to enactment. A balancing of interests and accommodations is more likely when input is provided before, rather than after the fact.

Footnotes

1. Financial Institutions Regulatory and Interest Rate Control Act of 1978, Title XX, Electronic Fund Transfer Act, Pub. L. No. 95-630 (hereinafter referred to as the EFT Act). The regulations promulgated for the two sections of the law now in force were published at 44 Federal Register 18468 (1979) [hereinafter referred to as Reg. E]. Reg. E will be codified in 12 Code of Federal Regulations §205.

2. EFT Act §919; §205.10.

3. The following states have some legislation or regulations pertaining to the consumer-financial institution relationship: Alabama, Colorado, Florida, Georgia, Iowa, Kansas, Michigan, Minnesota, Montana, New Mexico, Virginia and Wisconsin.

4. EFT Act §903(6).

5. EFT Act §§915, 916.

6. See 15 U.S.C. §§1601-1665 (Supp. 1978).

7. EFT Act §911(b).

8. Customer Information File, as used in this article, encompasses the IBM CIF concept of system-linked but independent consumer account files as well as a single large customer file segmented by account type.

9. EFT Act §905; Reg. E §205.7.

10. EFT Act §906(a).

11. In view of the recent attention given check truncation and the likelihood that the same elements of information will have to be captured and reported for such transactions in order to gain consumer acceptance, financial institutions should also consider truncation when designing data capture methods for EFT.

12. EFT Act §909(a); Reg. E §205.6.

13. Compare EFT Act §909(a) with Reg. E §205.6(b)(2).

14. EFT Act §909(b).

15. At least partial liability coverage is now available under Insurance Programmers' "Electronic Terminal Insurance Policy." Inquire by calling 312-593-3121.

16. EFT Act §906(f).

17. See Fenwick & Davidson, Admissability of Computerized Business Records, *14 Am. Jur. Proof of Facts 2d 173 (1977) (see §17 in particular).*

18. EFT Act §910(a).

19. EFT Act §910(b).

20. EFT Act §908(f).

21. EFT Act §908(e).

22. A preauthorized electronic fund transfer is a debit or credit authorized in advance to recur at regular intervals.

23. For example, currently in Wisconsin less than 10% of the EFT transactions are POS transfers involving third parties. Most transactions are still between the consumer and the financial institution in which no right of reversibility exists.

24. Reg. E, Appendix A, §A(7) defines these actions as being in the ordinary course of business.

25. The report is summarized in the American Banker, *April 26, 1979, at 1.*

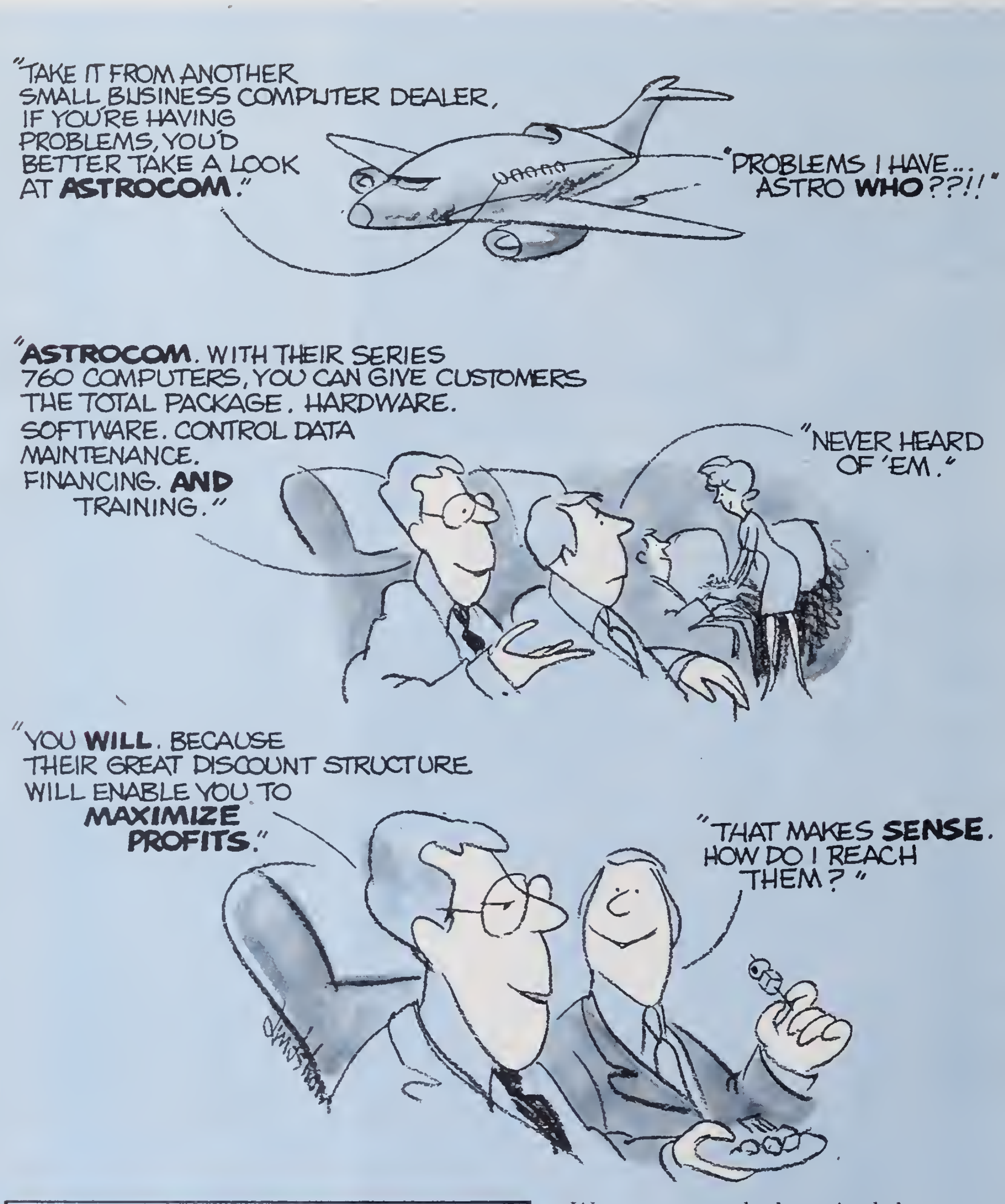
26. Another flaw in the Financial Privacy Act has apparently been corrected. See Legal Times of Washington, May 7, 1979, at 1. Federal financial institution regulatory agencies had refused to advise the Justice Department of suspected customer violations of federal law uncovered during the examination process because of the law's ambiguities.

Fred Greguras is an associate with the law firm Kutak Rock & Huie of Omaha, Neb.

Greguras has taught law at two universities and served as a consultant on EFT to the Nebraska State Department of Banking and Finance and to the Nebraska legislature. He has published and spoken extensively on EFT.

Currently he serves as chairman of the EFT Subcommittee of the Committee on Law and Computers of the American Bar Association's Section on Science and Technology.

The views expressed in this article are those of the author and do not represent the position of the American Bar Association.


"TAKE IT FROM ANOTHER SMALL BUSINESS COMPUTER DEALER, IF YOU'RE HAVING PROBLEMS, YOU'D BETTER TAKE A LOOK AT ASTROCOM."
"PROBLEMS I HAVE... ASTRO WHO??!!"
"ASTROCOM. WITH THEIR SERIES 760 COMPUTERS, YOU CAN GIVE CUSTOMERS THE TOTAL PACKAGE. HARDWARE. SOFTWARE. CONTROL DATA MAINTENANCE. FINANCING. AND TRAINING."
"NEVER HEARD OF 'EM."
"YOU WILL. BECAUSE THEIR GREAT DISCOUNT STRUCTURE WILL ENABLE YOU TO MAXIMIZE PROFITS."
"THAT MAKES SENSE. HOW DO I REACH THEM?"

We want new dealers. And the sooner you get started with Astrocom, the sooner you start making money. Talk to Tom Frahm from Astrocom. He'll tell you about the total support he provides his dealers.

When you need us, we'll be there.

astrocom corporation

120 West Plato Boulevard
St. Paul, MN 55107
(612) 227-8651 Telex: 297421

SEE THE ASTROCOM 760 AT INTERFACE '80, BOOTH 201, MARCH 17-20, MIAMI, FLORIDA.

Smallest Ever Reported

IBM Tests Experimental Circuit Elements

YORKTOWN HEIGHTS, N.Y. — Scientists here at IBM's Thomas J. Watson Research Center have come up with a process to produce the smallest electronic circuit element ever reported.

The circuits, which have widths and thicknesses of only 100 to 200 atomic diameters, were made under experimental conditions using electron-beam lithography. That technology was originally developed to make large-scale circuits. However, IBM claims to have made technological advances in the process to allow it to be applied to supersmall circuitry as well.

The IBM research also suggests scientists can build and test circuitry that is one hundredth the size of today's already tiny computer chips. IBM says the circuits it is now testing are smaller than a single human nerve fiber.

The key to the process is a device called a nanobridge. It is a thin film of superconducting niobium metal 40 nanometers wide, 30 nm thick and about 120 nm long.

By making the metal superconductive, or chilling it to absolute zero (-273° C), the metal is said to lose all resistance to electricity. This allows information to pass through the circuits at speeds much faster than today's technology, IBM said.

Josephson Computer

The principal of superconductivity is the basis of a Josephson computer. Although the groundwork of the Josephson computer — a machine 20 times faster than any of today's computers, with three times as much memory — was theorized in the early 1960s, the technological obstacles have yet to be overcome.

IBM s research by Dr. Robert B. Laibowitz, Dr. Alec N. Broers, Dr. James T. Yeh and Joseph M. Viggiano may be the first real steps to building a prototype of a Josephson computer. Although IBM won't say how soon it plans to have such a computer on the market, sources say the research should net a Josephson prototype within five years and a commercially available Josephson computer in about 15 years.

The superconducting circuits, which are now being tested, exhibit Josephson effects. These nanobridges, or "weak" semiconductors, allow a supercurrent of electron pairs to flow between connecting semiconductors with no voltage difference across the link (called a dc Josephson effect).

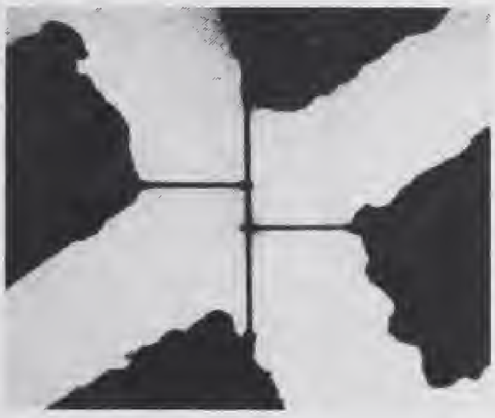
In addition, when electromagnetic radiation — in this case, microwaves — is applied to the nanobridge, dc currents are formed at equally spaced voltage intervals (called an ac Josephson effect), according to IBM.

Diffusion Length

The IBM researchers claim to have controllably built and tested superconducting nanobridges between 120 nm and 1000 nm long. Research into the dc Josephson effect gave the IBM scientists the first experimental information on the quasiparticle diffusion length for niobium.

This means the IBM scientists can determine how long the nanobridge can be before excessive heating becomes a problem. The longer the nanobridge, the scientists concluded, the greater the likelihood that heating will be a problem.

The results of the investigation revealed the niobium metal has a complex resistance behavior. The scientists theorize the granularity of the material is the reason. Individual niobium grains become superconductive first. Then, as the temperature is reduced, long-range coupling between the grains causes the whole bridge to become superconductive.



World's smallest experimental electron circuit elements have been made by IBM scientists.

The small grain size of niobium shows up in the very good edge definition of the bridges, IBM added.

An IBM spokesman could not say when the researchers' efforts might be translated into a commercially available product.

Four Regional Firms Establish National Data Entry Service

PLYMOUTH MEETING, Pa. — A national data entry service has been formed by four regional firms to provide data entry work for users around the country.

(Desa) hopes to offer an alternative to the many local service bureaus in the U.S. that lack the capacity and multiple locations for quick turnaround and accuracy on major jobs, according to Desa President Richard C. Thompson.

The four charter Desa firms, which will continue to operate as independent companies as well, include Dataco, Inc. of Plymouth Meeting, Pa.; Data Systems, Inc. of Minneapolis; Information Control, Inc. of Kansas City, Mo.; and Input Services, Inc. of Atlanta.

Largest Capacity

Desa is believed to be the largest capacity data entry service in North America, according to Thompson. The data entry equipment of the four companies includes nine optical character recognition (OCR) systems and 12 key-to-disk systems at seven metropolitan area locations.

The Desa companies, each of which has been in the business for a decade or more, "can work together to bid jointly on very large and/or multilocation projects, purchase equipment and supplies collectively and exchange data entry techniques and applications," Thompson said.

In an industry estimated to have an annual volume of $400 million to $500 million, Desa plans to eventually expand either through addition of new Desa firms, expansion by current Desa firms or new operations by Desa itself, Thompson said.

Thompson, as president of Desa, has over 20 years of experience in the computer services sector, primarily with Scan-Data Corp. and Control Data Corp.

Desa, Inc. is located at Two Plymouth Commons, Plymouth Meeting, Pa. 19462.

A Way to Keep Computers on the Right Track

The Beall Channel Switch. Lets you switch critical on-line services to another CPU when failure occurs. Allows specific peripherals to serve more than one computer. Redrives all CPU signals to give you far more flexibility for physical placement of peripherals.

And Beall does all of this less expensively, more reliably and with less opportunity for operator confusion than anyone else.

We make five basic models to provide up to eight switchable interfaces each of which can be logically connected to as many as eight CPUs.

Want to track down more facts? They're in our new brochure. Write or call for it today.

John Beall & Company, Inc.
9103 Third Avenue ▪ North Bergen, N.J. 07047 U.S.A. ▪ 201/854-3562

Crime Fighting Time: From Hours to Seconds

By Henry Sedmak
Special to CW

Information is one of the most potent weapons in the fight against crime.

The Michigan State Police Law Enforcement Information Network (Lein) provides such information using a Burroughs Corp B6700, a statewide terminal network, auxiliary radio communications and on-line connections to state and federal agencies. Agencies affected include the Federal Bureau of Investigation's National Crime Information Center (NCIC), the Michigan Department of State, the National Law Enforcement Telecommunications System (Nlets). and other federal, state and local law enforcement and criminal justice agencies.

Lein simplifies communications and allows greater coordination and cooperation between and among Michigan law enforcement and other criminal justice agencies. In 1978, the system processed more than 72 million message transactions. As a result, Lein is increasing the effectiveness of law enforcement agencies throughout the state and is setting an example for more scientific crime control across the nation.

Lein originated in July 1967 under the late Col. Frederick E. Davids. Davids prophesied that "the computer, more than any single improvement since the two-way radio, will alter the course of police activities as we know them."

Col. Gerald L. Hough, present director of the Michigan Department of State Police, added, "Information is the lifeblood of law enforcement. The computer, more than any other police tool, makes possible the maximum use of that information."

Consolidated Records

Lein consolidates wanted person and wanted vehicle records from approximately 700 independent law enforcement sources.

The B6700 enables a law enforcement officer to initiate inquiries against a wanted-persons file that contains more than 312,000 records. Information on some 70,000 stolen and wanted vehicles and lost of stolen license plates is also available. In addition, an officer has access to approximately 350,000 computerized criminal history records.

Through the interface with the Secretary of State, vehicle registration and driver record information is made readily available upon inquiry. This interface also provides the officer with immediate access to about 100,000 suspended or revoked drivers' records.

A response to an inquiry usually takes only 15 seconds to 20 seconds. Formerly, a comprehensive check of all state jurisdictions consumed nearly six hours.

Terminals in each of 240 independent jurisdictions, located in state police and municipal police agencies as well as in some federal law enforcement agencies, can enter warrant and wanted vehicle information into Lein. Once entered, this information may be changed or deleted in seconds, but only by the originating jurisdiction.

The NCIC interface offers access to warrant, vehicle and stolen property files from other states. In addition, the officer has access to records on 1.3 million stolen and recovered guns, 1.7 million stolen securities, 825,000 stolen articles and 16,000 stolen boats.

Other jurisdictions may use this information but may not change it. In effect, each jurisdiction controls its own information "file" and has access to other agency records which have been entered into the system.

In addition, Lein provides informational services to several hundred in-car terminals and to termainals linked to local satellite systems. Radio relays connect small jurisidictions into the system.

This network is active 24 hours a day, 365 days a year.

Communications has been streamlined among all Michigan law enforcement agencies. The computer handles all message-switching automatically. Messages can be sent easily to one, several, or all the terminals in the network.

The system currently handles an average of 200,000 transactions per day. Radio traffic has been reduced substantially.

Ease of Use

The Lein was designed for easy use. Files are built and maintained on a real-time basis from terminals.

A series of worksheets guide information input and inquiry. Each line on a worksheet is code-numbered and designated for one type of information — name, hair color, license plate number and so on.

When an inquiry is made about a person, that person's record is searched for in the Lein files. A full report is then transmitted to the inquiring terminal. This report may include a complete description, name and any aliases, address and types of warrants issued.

If a warrant has been issued, the report may also indicate distances officers will travel from the original jurisdiction to pick up the person. Conditions under which this travel can occur and state extradition rulings can also be noted.

Success of 'Hits'

The success of computer-based police information files is best demonstrated by the number of "hits" experienced. A "hit" is an affirmative response from the computer advising that a person is wanted, vehicles or property are stolen or wanted and/or a suspended or revoked license is being presented.

An inquiry by a positive identifier, such as a driver's license number or Social Security number, will produce a "hit" if the person's record is in the file. Less absolute information, such as name, approximate age and physical description, may result in reports on several possible identifications. It is then the inquiring officer's responsibility to determine which, if any, of the names represents a "hit."

Unique Capability

The ability to enter approximate information and to make an identification is believed to be unique to Lein.

The extensive terminal network also provides an effective communication system for all Michigan law enforcement agencies through message switching.

Messages may be sent from one terminal to another, to all terminals in each of 19 areas or to all terminals in the system simultaneously. Some messages are sent automatically when new information is entered into the Lein files.

Sedmak is executive secretary of the Lein Policy Council in E. Lansing, Mich.

COMPUTER OPERATIONS

PLANNING EDP EXPANSION? New Site? Modernization of Existing Facilities?

D.P. Facilities Engineers and Designers have 20 plus years of experience to move your facility into the next generation.

- Advance Techniques in Architectural, Engineering and Interior Design.
- Construction Methods & Materials
- Environmental Air-Conditioning
- Uninterruptible Power & Voltage Stabilization
- Fire Detection & Suppression
- Total Security

TIME A FACTOR? Call our D/C expedite group today — for a guaranteed completion date.

(212) 674-8600

D.P. FACILITIES INC., NATIONAL
Div. F.C.I. Facilities Construction, Inc.
250 Park Ave. South, N.Y. 10003

Low Cost
Card Punch
and
Card Reader
for
DEC HP DG IBM
Computers

The CCC 1700A Keypunch Interface can connect your computer, time-share terminal, or any bit serial communicating device to an IBM 129 or 029 Keypunch so it will both punch *and* read data cards! It's EIA compatible, converts ASCII or any bit serial code to Hollerith when punching, converts Hollerith to ASCII or any bit serial code when reading, and permits the efficient transfer of data through a 900 character buffer. The 1700A operates at all standard baud rates from 110 to 9600. And it requires no special software drivers; standard Basic or Fortran "PRINT" or "WRITE" statements work just fine!

CCC
COMMUNITY COMPUTER CORPORATION
185 West School House Lane • Philadelphia, PA 19144 • (215) VI 9-1200

The Mouse™ That Stored

Once there was an accounting department, manufacturing V.P., and an engineering manager, not to mention a president, who were very unhappy.

Why?

Because they were memory poor.

PART II
Enter our hero. The Mouse™. The one that stores. Stores up to 100* megabytes, in fact. And does it in one compact, self contained, DEC plug-compatible unit.

The Mouse™ contains power supply, controller and two industry proven Fujitsu disk drives, which combine high reliability (6,000 Power-On-Hours MTBF) with fast access (30 msec average, 06 msec track-to-track).

But do you know what the best part of this story is? The Mouse™ is only $19,995 in single quantities. Almost **50% off** a comparable DEC system; plus, there's immediate delivery.

And that's no fairy tale.

*Unformatted

The 30-Day Faster Coupon
Send information. With a name like The Mouse, I've got to see what else is in store.
Name/Title ______
Company ______
Address ______
City/State/Zip ______
Tel. No./Ext. ______
DEC System ______

CVM Systems
585 Manzanita—Suite #7
Chico, CA 95926
Telephone: (916) 895-8322

WHAT SPERRY UNIVAC IS DOING IN THE MINICOMPUTER BUSINESS.

WE COULD MAKE JUST MINICOMPUTERS. BUT THERE'S NO FUTURE IN IT.

Not for us. Or for our customers.

The basic V77-600 and V77-800 are super powerful, high performance, Pascal speaking minicomputers. But standing alone they can't do everything for everybody.

That's why we've designed a complete line of competitively priced support peripherals. With Sperry Univac you can expand the utility of your system and continually provide capacity for growth with peripherals specifically compatible to your Sperry Univac minicomputer.

Now as your data processing needs grow you can forget the hassle involved in adapting peripherals from other manufacturers to suit your DDP system. With Sperry Univac you can standardize your computer equipment from a simple V77-200 minicomputer all the way into mainframes.

INTRODUCING OUR FAMILY.

Our minicomputer customers needed reliable, quality support from one source so we developed a complete line of peripherals. Some of the peripherals we now have available include:

- Diskette storage system
- 10 MB cartridge disk system
- 30 to 232 MB disk storage system
- 800/1600 bpi mag tape units
- Sperry Univac serial printer
- 300/600 LPM printer
- Card reader
- Asynchronous buffered terminal
- Sperry Univac UTS 400 master and slave terminals
- Sperry UNISCOPE 200 terminal
- 3270 compatible terminal

And, of course, we introduced SUMMIT, the interactive, multi-terminal system with transaction processing and data base management. It gives you easy editing, screen formatting, and documentation aids, plus comprehensive program development.

SUMMIT also offers flexibility for software design and allows our system to speak not only Pascal, but COBOL, FORTRAN, and RPG II.

WE TAKE CARE OF OUR CUSTOMERS.

The Sperry Univac sales and service network is one of the largest and most responsive in the world. With over 8000 customer engineers available to keep our systems up and running, we can provide prompt, complete service for both our minis and peripherals on a worldwide basis.

And that service is the finest. We've established a major computer education center in Princeton, New Jersey and several regional training schools throughout the United States and Europe. Our educational system insures the degree of excellence and competency in our service staff necessary to maintain all our equipment at peak performance.

OUR TOTAL COMMITMENT.

At Sperry Univac we have a reputation for quality, performance and service in the computer industry.

That's why we've committed ourselves to a major investment in facilities, research and development, quality control and worldwide service. We want to produce a complete line of dependable, reasonably priced minicomputer systems that are as respected as Sperry Univac mainframes.

We want to keep you in the family.

For more information, write to us at Sperry Univac Mini-Computer Operations, 2722 Michelson Drive, Irvine, California 92713. Or call (714) 833-2400, Marketing Communications.

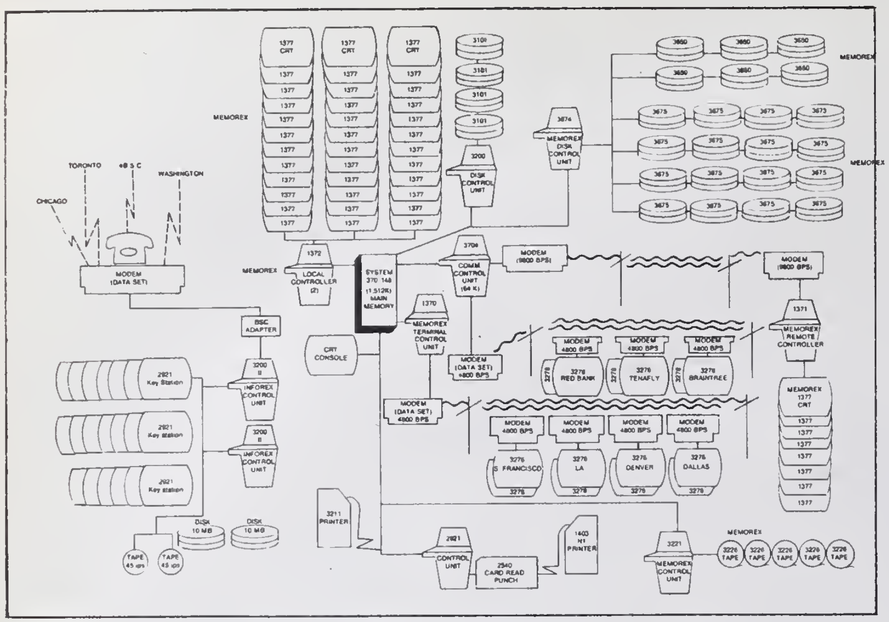
In Europe, write Headquarters, Mini-Computer Operations, London NW10 8LS, England.

In Canada, write Headquarters, Mini-Computer Operations, 55 City Centre Drive, Mississauga, Ontario, L5B 1M4.

SPERRY UNIVAC

SPERRY UNIVAC IS A DIVISION OF SPERRY RAND CORPORATION

System Renews Reliability For Subscription Service



The Ebsco DP Configuration

BIRMINGHAM, Ala. — One of the by-products of the 20th century's "information explosion" is an almost exponential growth in the number of periodicals, newspapers, annuals and irregular book series serving science, industry, technology, business and the general public.

Keeping track of and ordering relevant serial publications has become a monumental and costly task for public and institutional libraries, and DP is playing an increasingly important part.

Ebsco Industries, Inc., for instance, an international firm specializing in subscription services, is tying together a number of regional offices in a computer network through which a library can order any title currently published anywhere in the world.

Last year Ebsco processed more than 2.7 million orders to various publishers, using a data base of more than 160,000 titles from approximately 48,000 publishers worldwide, a billing file of more than 36,000 entries and a subscriber file of about 133,000 names.

Ensuring Reliability

"With the volume of business we do," John Krontiras, vice-president of DP, said, "reliability is all-important. If our terminals, terminal controllers or data files go down, our customers are greatly inconvenienced. So we do everything we can to ensure reliability."

One step Ebsco has recently taken to ensure maximum uptime of its tape and disk data storage files and its CRT terminals is to replace much of its previous equipment with Memorex Corp. equipment.

"When I moved to Birmingham in 1971, I'd already had a number of years' experience with Memorex," Krontiras explained. "So when we started running into reliability problems with some of the gear we had at Ebsco, we turned to Memorex, which offered us the price/performance balance we needed."

Memorex equipment currently configured with the IBM 370/148 includes 16 spindles of 3675 disk for a total of 3.2G bytes (200M bytes per spindle), six spindles of 3650 disk for a total of 1.9G bytes (317.5M bytes per spindle), five 3226 tape drives, 44 1377 CRT terminals (36 local and eight remote), a 1372 local terminal controller, a 1371 remote terminal controller and a 2089 printer.

In addition, the mainframe's 1,512K bytes of internal memory includes 512K bytes of Memorex add-on memory. Most of the equipment has been installed gradually over the past several years.

Ebsco Industries uses its system to support a large number of different divisions and functions within the company. In addition to handling subscriptions, the system processes batch accounts receivables and on-line accounts payables for all divisions — from sales and service to manufacturing.

By far, the largest user of Ebsco's DP resources is the Subscription Services Division, which accounts for about 75% of system usage. In addition to placing orders with publishers and handling service inquiries from subscribers, the division uses the system to maintain complete customer and title records.

Specialized reports help customers with internal auditing and maintenance of periodical dispersal. The division also maintains an inventory of back issues for servicing customer claims.

Regional Offices

Through 11 regional offices in the U.S. and offices in Toronto, Rio de Janeiro, Brazil, and Amsterdam, Holland, Ebsco provides fast, personalized service to its customers. Each office is staffed to handle both order processing and customer service.

The regional offices are supported by the Data Processing Service Center, Title Information Department, Publisher Services at international headquarters in Birmingham and Publisher Relations near New York.

Customers can subscribe to periodicals using Ebsco's *Librarian's Handbook,* which contains more than 100,000 of Ebsco's 160,000 titles, with about 55% U.S. representation and 45% non-U.S.

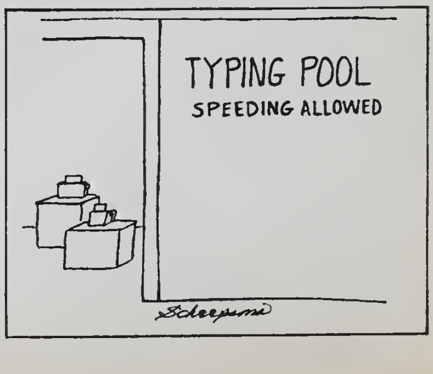
The Title Information Department can inquire into the title file on disk using CRT terminals to obtain the most current ordering and price information. For titles not listed in this file, Ebsco will use its bibliographic research facilities to locate the appropriate title and publisher.

Orders and claims placed at the regional offices are transmitted to the DP center in one of two ways. Those placed in Chicago, Toronto or Washington D.C. are entered into a key-to-disk system and transmitted in batch mode over dial-up telephone lines.

Those that come in through offices in Redbank or Tenafly, N.J. Braintree, Mass., San Francisco, Los Angeles, Denver or Dallas, can be transmitted either through the mail or by means of remote on-line terminals through the Ebsco Communications Network (Ebsconet) system, depending on how soon the customer wants the order to start. The Ebsconet operation has been tested and operated successfully in the Birmingham area, and Ebsco plans to have all order entry and claims processing on-line in the future.

Orders and claims coming in through the key-to-disk system or through the mail go to the data entry department for key-punching and recording on tape. On-line CRT orders and claims go directly onto disk. Once a week all the orders are merged and processed.

Orders are automatically edited and order requests and checks are sent to the associated publishers for every customer's order. Invoices are also produced for each customer.



Genuine Computer Gold

We buy, sell and lease all kinds of computers and peripherals. Large or small. New or used. So we offer prospective computer buyers many a golden opportunity for substantial savings.

Our nationwide referral network locates the hardware you need. (We specialize in IBM.) In-house financing is available. And we guarantee the equipment will be maintainable by the manufacturer.

SADDLEBACK MARKETING CORPORATION
1400 NORTH BRISTOL • SUITE 170
NEWPORT BEACH, CA 92660
Phone: (714) 833-9800
TWX: 910-595-2550
Member Computer Dealers Association

EVER
TRY TO SQUEEZE
132-COLUMN
PRINTER DATA INTO
AN 80-COLUMN
DISPLAY?

You don't have to squeeze anymore. Now you can have both "80" and "132" on the same display. The choice is yours—operator selectable—with LDC's advanced Series 300 **SOFTPRINT**™ Display Systems. **SOFTPRINT** Remote Clustered Systems emulate the IBM 3274. And they're great for on-line program development and browsing print files.

SOFTPRINT™

LDC

LEE DATA CORPORATION
5700 Green Circle Drive • Minnetonka, MN 55343 • (612) 932-0300

System Clues Paramount as to Movies' Success

HOLLYWOOD, Calif. — A mainframe helps alert Paramount Pictures here to early signs of whether a new film release is a smash hit or a box office flop.

This information enables the 63-year-old movie company, a subsidiary of Gulf & Western, to modify its marketing strategy. For example, advertising may switch emphasis if the film is doing poorly in Chicago but is successful in Dallas, as sometimes happens, according to Richard Gallagher, vice-president of management information systems.

The film popularity application is an offshoot of a wide range of on-line applications developed by Paramount to handle accounts receivable, film distribution, payroll, personnel and television syndication.

"We've had a 48% increase in transactions in just three years — without an increase in paperwork or personnel. Our goal," Gallagher said, "is to eliminate all bookkeeping paperwork and to allow the branch to function once again as a sales office."

The newest application to go on-line is keeping track of film prints. There may be 700 or 800 prints made of a major movie release. And there may be eight or 10 "cans" (segments) per print.

Paramount recently had about 6,000 film prints in daily use throughout the country.

The company has 20 sales offices throughout the country. Each office has terminals linked to a central IBM 3031 CPU in New York City.

The sales offices market films directly to individual theater owners or to theater chains. Rental agreements for films usually contain a wide variation in terms. Small rural theaters may change movies two or three times weekly, while metropolitan houses may decide to hold over a movie several weeks beyond the time allotted.

The terms of the agreements are captured in the computer's pending contract file to await home office approval. Once approved, a play date is established, and the computer automatically updates all pertinent files such as performance record, print control record and booker's daily register.

Once all files are updated, the sales office mails the contract to the exhibitor and a specific film print is assigned to the engagement.

Each day, the system checks the file to flag those movies scheduled for showing one week from that date. This activity, known in the trade as "calling the book," results in automatic posting of sales records, authorization to ship the film to the exhibitor and the printing of the shipping label.

When the film showing is completed and the sales office has calculated rental due from the theater, this data is entered at the office's CRT terminal for home office approval. Once approved, it is posted to the sales performance record and the accounts receivable record.

The film popularity application enables major films being shown as first runs to be tracked by the sales offices. Daily theater gross box office receipts are entered into the terminal. These grosses are obtained from sales office personnel who actually telephone the theater each day the new release is showing.

Based on these amounts, Paramount management can determine quickly whether the film is a box office success.

Paramount sales personnel in Los Angeles transmit information to IBM 3031 in New York.

PROGRAMMABLE PORTABLE TERMINAL

The breakthrough solution to the paperwork explosion.

Equip your field salesmen, service representatives, accounting personnel, production-line supervisors, store managers. drivers and inventory-takers with handheld terminals that can prompt them to record their information in solid state memory — instead of writing it down.

One quick phone call transmits all data to your computer center for processing — and then the computer can send back a new set of instructions and the latest price list, inventory status or other data base information for the terminal user's easy reference. Faster, more accurate information turnaround — with the MSI portable terminal that thinks for itself.

For further information please write to William B. Patton, Vice President-Marketing.

MSI
DATA CORPORATION
THE LEADER IN PORTABLE DATA TERMINALS
340 Fischer Avenue, Costa Mesa, CA 92626 (714) 549-6000

Florida Schools' System Sparks Pupil Interest

CLEARWATER, Fla. — The Pinellas County School Board here is utilizing its computer system in thousands of everyday administrative and educational "transactions" and is planning even more elementary-to-secondary applications in years ahead.

With 91,000 students attending 105 schools, the Pinellas County system is the fifth largest in Florida. During the current school year, the system employs some 8,600 full-time instructional and administrative personnel and 1,500 part-time personnel. On the full-time staff, approximately 5,000 are teachers.

The Honeywell, Inc. Series 66/05 large-scale system, in operation since June 1978, backs up both administrative and managerial functions and in-school educational processes. The school board started using computers in 1958, when it acquired a Univac system. It switched to an IBM 1401 in 1963 and then to Honeywell processors in 1966.

Interest in computers is so great, Pinellas school officials said, that courses in computer science and computer languages are now offered to students in some of the county's high schools.

Walter J. Croke, director of DP for the school system, said 40 terminals are in operation (26 at school locations), and monthly computer usage averages 700 hours of logged time. During one recent month, there were 34,305 inquiries (almost 24 per minute, 24 hours a day), with more then five million lines of print generated. During the same month, 22,991 payroll checks and 3,093 accounts payable checks were written.

The Pinellas On-Line Attendance Reporting System (Polars) is utilized by five senior high schools, 19 middle schools and 67 elementary schools, providing preprinted, biweekly class lists which enable teachers to "bubble in" marks for student absences. Each day, class rolls are scanned by the optical reader to produce an absentee report for deans, to maintain each student's overall absentee record for the school year and, in accordance with school board policy, to keep track of total absentee days.

These schools can also handle student registration within their own facilities, using their own terminals and optical readers. This on-line registration and scheduling capability allows for "immediate turnaround on tallies" and provides for total in-school student data preparation.

Other administrative/managerial services provided by the Honeywell 66/05 include personnel benefits and income protection tabulations; school lunch inventories; warehouse accounting and inventory; fixed assets (property) records; a student course selection file (by student's name, grade, school number and course numbers); student grade reporting; testing and automated student census.

One of the most visible services provided by the computer is the scheduling and control of 8,000 films on file in the Pinellas school system.

Educational Capabilities

Regarding educational capabilities of the computer, Richard D. Pate, director of curriculum and instructional applications, noted that 1,600 Pinellas students are exposed to the system's terminals every day.

In the future, Pate anticipates the system will also be used to teach computer science as part of the high schools' business curriculum. For now, students at five of the county's 12 high schools have access to terminals for mathematics and physics problem-solving.

At Clearwater High School, for example, a group of physics students can use the CRT terminal to plot the simulated trajectory of bullets. A physics instructor has programmed the computer to simulate the firing of a gun with a muzzle velocity of 130 meters per second. Within a margin of error of ten meters, the student must find the angle of trajectory to hit a target at a distance of 1,000 meters. The Eniac, generally acknowledged to be the first practical digital computer, was developed for the U.S. Army primarily to compute artillery shell trajectories.

The schools' 66/05 is configured with 384K words of memory, four 200M-byte disk drives, five 120-byte tape units, one 1,200 line/min printer, one 1,050 card/min card reader, a Datanet 3545 front-end network processor and 40 terminals.

– HP –
SPECIALS
7925S
$12,500
7970E – Slave
$4,500
2113 MXE 32K
$9,000
CRISIS
COMPUTER
CORP
2356 Walsh Ave Santa Clara CA 95051
(408) 246-0402
For domestic and international sales
TWX 910-338-7330

FROM DECEMBER 1 TO FEBRUARY 29, WE EXPECT LESS FROM OUR CUSTOMERS.

Basis of 60-Terminal Network

County, City, School Share Dual Processor

WINSTON-SALEM, N.C. — Forsyth County, the City of Winston-Salem and the Winston-Salem Forsyth County School System are using a dual-processor system to consolidate computer jobs, increase processing capabilities and develop an on-line land records information system.

John W. Jones, the county's DP director, said county, city and school board officials decided to consolidate their computer services in July of 1978. "The county now provides computer support for an on-line network of 60 CRT terminals that services the county, the city and the school board," he explained.

The Burroughs Corp. B6800 system presently handles a large number of applications for its three users, including election registration, tax billing and reappraisal, student information on 43,000 students, centralized purchasing, a county sheriff's warrant system, a police information system, vital statistics, health center billing for the county's Reynolds Health Center and general accounting and payroll.

The city police information system, operating 24 hours a day, is one of the most critical applications handled by the B6800. This system allows a Burroughs B800 computer, located in the city's police department, to switch terminal-entered inquiries between the county, state and national law enforcement information network as required, depending on the type of information entered.

Land Record System

Forsyth County's B6800, using Burroughs' Data Management System II (DMS II) software, also is being used to develop a unique land record information system that will eliminate the traditionally arbitrary numbering system for identifying county parcels of land for tax assessment and other requirements.

It will use a minicomputer to drive a graphics printer and plotting equipment. The county has digitized its tax maps, through aerial photographs, with X and Y coordinates that will enable county employees engaged in deed, tax or land management work to instantly locate any parcel of land in the county. The system will also make specific information about a given parcel available to a user upon request.

"We should be able to create virtually any type of map that may be required by a city or county employee," Jones said. The county recently received a Department of Housing and Urban Development (HUD) grant to further expand and refine this application.

Jones said the county is presently engaged in further developing its land records information system using the HUD grant. He noted, however, that the county will soon begin to revamp a number of its accounting and financial applications, including general ledger, accounts payable and receivable and other accounting systems in order to have better control over these applications through a fully integrated financial system.

The B6800 handles the county's social services applications and transactions. By recording information received from applicants for social services and then comparing this information with strictly defined prerequisites for qualification, the system can determine whether a particular applicant qualifies for services offered by the department.

The B6800 communicates with various city, county and school board departments through 60 on-line TD 830 CRT terminals. A number of the terminals are located at the Hall of Justice, but many are in offices located throughout the city, as far as 10 miles away.

The county decided to purchase the B6800 system after considering bids from a variety of vendors because "Burroughs offered us the best price/-performance ratio in large systems, and it also was able to provide us with the software we needed to run the diverse programs we had in mind," Jones said.

In addition to DMS II, Forsyth County uses other Burroughs program products including Network Definition Language (NDL), Command and Edit (Cande) language, and Report Writer (Reporter) used for generating reports for city, county and school board departments.

The dual-processor B6800 has 5M bytes of main memory, 3.4G bytes of disk pack storage in 10 dual disk pack drives and two 1,100 line/min line printers. It communicates with two remote sites that are equipped with B761 remote job entry systems. One system is at a city site and one is at a school board site.

From December 1 to February 29, 1980 you can save 18–25% by using this whole page coupon when ordering DEC® compatible disc products from Plessey. That's right. We're not only offering dramatic savings on disc subsystems and their controllers for your PDP-11® and PDP-11/70® we're also delivering with our usual Plessey promptness. So now you can have Plessey high performance, fully compatible equipment for even less than our everyday, lower-than-DEC prices.

ORDER HERE MODEL	NEAREST DEC EQUIV.	DESCRIPTION	LIST PRICE	DISCOUNTED PRICE
☐ PM-DSV11/B or ☐ PM-DSV11/C	RK11D+RK05J RKV11D+3 RK05J	5 or 10MB cartridge disc subsystem with single board controller for the LSI-11	$ 7,810	$ 6,250
☐ PM-DS11/B or ☐ PM-DS11/C	RK11D+RK05J RK11D+3 RK05J	5 or 10MB cartridge disc subsystem with 4 board controller for the PDP-11	$ 8,410	$ 6,130
☐ PM-DS8/B or ☐ PM-DS8/C	RK8E+RK05J RK8E+3 RK05J	3.32 or 6.64MW cartridge disc subsystem with 3 board controller for the PDP8	$ 8,085	$ 6,470
☐ PM-DS11/80	RP11C	62.4MB disc pack storage for the PDP-11, with controller. Emulates DEC's RP11.	$15,550	$12,440
☐ PM-DS11/300C	RJP04,05,06	254MB disc pack storage for the PDP-11, with controller. Emulates DEC's RH11.	$25,180	$20,145
☐ PM-DSW11/300	RWP04,05,06	254MB disc pack storage for the PDP-11/70, with controller. Emulates DEC's RH70.	$33,875	$27,100
☐ PM-XS11B	RX11-B	512KB dual floppy subsystem with 1 board controller for the PDP-11.	$ 3,580	$ 2,865
☐ PM-DCV11	RKV11	Single board disc controller for the LSI-11. Supports up to 20MB.	$ 1,800	$ 1,385
☐ PM-DC11	RK11	Disc controller for the PDP-11 for 10MB, 5MB, or 2.5MB drives.	$ 2,500	$ 1,925
☐ PM-DC8	RK8E	Disc controller for the PDP-8 for 1.66MW, 3.32MW, or 6.64MW drives.	$ 2,125	$ 1,675
☐ PM-DC11/80	RP11C	Mass storage disc controller for the PDP-11. Emulates DEC's RP11C.	$ 6,155	$ 4,295
☐ PM-DC11/300C	RH11+RJP04 control logic	Mass storage disc controller for the PDP-11. Operates up to 8 254MB drives. Emulates DEC's RH11.	$ 8,955	$ 7,164
☐ PM-DCW11/300	RH70	Mass storage disc controller and coupler for the PDP-11/70. Emulates DEC's RH70.	$17,650	$13,590
☐ PM-XC11	XCV11	Single density floppy disc controller for the PDP-11. Allows diskette formatting.	$ 1,800	$ 1,370

Complete your order on this page and mail. (Or telephone for immediate service.)

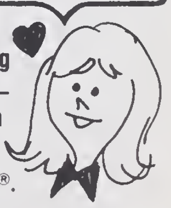
☐ Check enclosed.
☐ Bill me.
☐ Amount of order $__________
(add sales tax in Calif.)
☐ Company P.O. #__________

Name__________Telephone__________
Company__________
Address__________
City/State/Zip__________

This limited time offer is valid through February 29, 1980, and prices are valid only in the continental U.S.A. Payment must accompany order, or prior approval of credit must be obtained.

Plessey Peripheral Systems
The only real alternative.
17466 Daimler, Irvine, California 92714 (714) 540-9945

® Registered Trademark of the Digital Equipment Corporation.



SHOCKWATCH®

If you like pack handling seminars — you're gonna love Shockwatch®.

Shockwatch® is a precise impact detector which can prevent the **use** of damaged disk packs and cartridges Media Recovery, Inc., 1435 Roundtable, Dallas, TX 75247
Call toll free: 1-800-527-9497.

A computer & office systems conference and expo that really pays off.

Check it out.

As a decision-maker in a competitive business, you know that computer-based business products can go a long way towards beefing up that bottom line. And if you've been thinking that the big, national shows are the only places to see the newest computer and office systems products, we've got good news for you.

The Expo '80 Conference & Exposition brings the very latest information and equipment *to you*. Probably just across town, if you're in a major market.

At Expo '80, you'll find the most respected manufacturers in the field, as well as a professional forum for the discussion of today's important applications topics. And because Expo '80 is on your home ground, there's a personal, "local" flavor that's friendly, meaningful, and productive.

One stop shopping.

Expo '80 combines computers and office systems in the same show. You'll see everything from small business systems to electronic mail equipment, to word processing systems. All demoed by the industry leaders. Tandem, Data General, Hewlett-Packard, Sperry Univac, RCA, CADO/Benchmark, Memorex, Control Data, General Electric, Lanier, Intel, Qume, Diablo, Word Stream, Basic Four, Olivetti, A.B. Dick, and many more.

Custom-made conferences.

Expo '80's conference program addresses the subjects that *you* want to hear about: Word Processing Solutions for the Office Paperwork Bottleneck, The Banking/EFTS and Retail/POS Linkup, New Data Entry Techniques for Data Bases, Computer Graphics, WP & DP in Tomorrow's Office, and Output Techniques for Distributed Processing, to name just a few.

Stay right where you are.

Here's a list of the stops on the Expo '80 Tour. Be sure to mark your calendar now for the show in your area.

San Francisco Bay Area March 19-21
Los Angeles March 25-27
Dallas April 1-3
New York April 22-24
Baltimore April 28-30
Boston May 6-8
Detroit June 3-5
Chicago June 10-12
Cincinnati June 17-19

If you'd like more information or registration materials, just call the 800 number. In Massachusetts, call 617-964-4550. We'll be happy to give you all the details.

EXPO 80

Computer &
Office Systems
Conference
& Exposition—
800-225-4260.

Produced by the Conference Company, a member of a family
of corporations dedicated to the world of computers
and their uses. The Conference Company,
60 Austin Street, Newton, MA 02160.

For Non-DP Professionals

HP Unveils Personal Computer System

By Jeffry Beeler

CW West Coast Bureau

CORVALLIS, Ore. — Hewlett-Packard Co. recently unveiled a personal computer system that is said to include all the hardware modules a business or technical professional needs to perform dedicated applications.

Described by HP as both portable and "friendly," the HP-85 is the veteran systems manufacturer's first venture into the personal computer field. The system reportedly combines a CPU, CRT terminal, printer, cartridge-based mass storage unit and interactive graphics capability in a single 20-lb package that occupies about as much space as a standard electric typewriter.

A library of canned application packages, each written in interpretive Basic and stored in cartridges, reportedly makes the stand-alone system suitable for personal use by engineers, scientists, accountants, investment analysts, marketing managers, consultants, lawyers, doctors and other professionals with little or no computing expertise.

Manufactured by HP's Corvallis Division, the HP-85 provides roughly the same amount of computing power as the company's 9825 and 9835 desktop systems, although it clearly belongs to a different product class from those two units.

Compared to non-HP products already on the market, the system comes closest to competing with the Apple Computers, Inc. Model II, the Radio Shack TRS-80 and the Commodore Business Machines, Inc. Pet 2001 system, an HP spokesman said.

Memory Expansion

In its basic configuration, the HP-85 incorporates 16K bytes of random-access memory (RAM) and 32K bytes of read-only memory (ROM). But by plugging additional memory modules into one or more of the system's four built-in input/output slots, users can expand the RAM to 32K bytes and the ROM to 80K bytes, the spokesman said.

ROM expansion takes place with the help of an "ROM drawer," a holder that provides space for up to six 8-byte memory modules.

In addition to permitting memory expansion, the system's four I/O slots allow users to attach assorted peripherals, including the HP 7225A plotter, HP 2631A printer and an unidentified floppy disk unit slated for introduction sometime in 1980, the source said.

The HP-85's 5-in., black-and-white CRT screen uses a 256-char. set and a 5x7 dot matrix pattern to display up to 16 lines simultaneously, with as many as 32 char./line. A 4K-byte CRT-display memory holds up to four pages of data, which can be maneuvered into position on the screen with a "scrolling" capability.

In graphics mode, the integrated terminal presents data in a 256 by 192 dot field, for a total of 49,152 displayable points.

The display screen's operations are controlled from a built-in keyboard that incor-

(Continued on Page 78)

Sentinel Small Business System Incorporates Dual 16-Bit MPUs

CINCINNATI — Sentinel Computer Corp., formerly Computer Systems Development, Inc., has pulled the wraps off another microprocessor-based small business computer system, this one using two 16-bit MPUs structured to function simultaneously while executing the same job.

The Model 50 is closely patterned on the company's four other micro-based systems — the models 10, 20, 30 and 40 — and relies on an Intel Corp. 8086 chip for processing power. However, the newer model has two integrated microprocessors and a minimum of 128K bytes of main memory that can be optionally expanded to 1M byte.

The firm's Model 40, introduced along with the other three about a year ago, had only a minimum of 64K bytes of main memory, a spokeswoman said.

The Model 50 package includes four 1,920-char. CRT terminals, a 150-char. printer, an 800K-byte diskette drive and a 29M-byte Winchester hard disk drive whose capacity can be optionally boosted to 116M bytes, the spokeswoman continued.

Sentinel Computer Corp.'s Model 50 business system is shown with three of its four standard CRT terminals.

Since all of Sentinel's other computer systems are built around the 8086 chip, previous systems can reportedly be field upgraded to a Model 50 capacity by adding a second microprocessor.

The system costs $43,500 from the firm at 9902 Carver Road, Cincinnati, Ohio 45242.

Axiom Unwraps Impact Printers

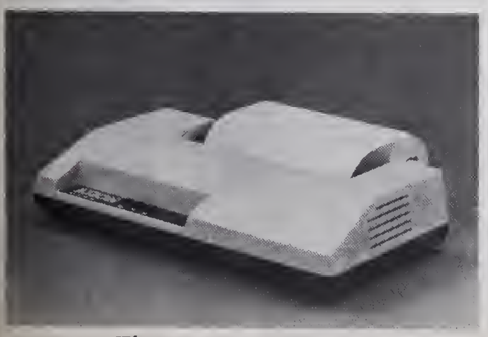
GLENDALE, Calif. — Axiom Corp. has introduced two low-profile impact printers that feature a 512-char. print buffer and include either a friction-feed or tractor-feed mechanism.

The IMP-1 and IMP-2 both have a standard 96-char. set and can produce double-width characters for headlining or accenting. However, the first unit has a friction-feed device that is geared for word processing operations while the second printer has tractor feed and can handle graphics under software control, a spokesman noted.

Standard inputs for the printers include Centronics Data Computer Corp. parallel and RS-232C, 20mA serial, up to 1,200 bit/sec. A 9,600 bit/sec serial input device is optionally available, he added.

The IMPs consist of a continuous-duty print mechanism, with ribbon cartridge and single snap-out board to facilitate maintenance. The friction-feed IMP-1 costs $695 and the tractor-feed IMP-2 sells for $795.

Quantity discounts are available from Axiom at 5932 San Fernando Road, Glendale, Calif. 91202.



The Axiom IMP Printer

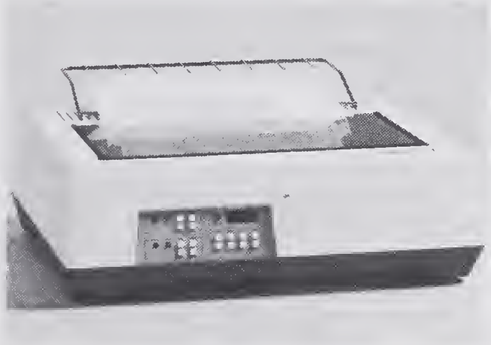
Datasouth Dot Matrix Printer Can Print at 180 Char./Sec

CHARLOTTE, N.C. — Datasouth Computer Corp. has unveiled a dot matrix serial printer that incorporates a bidirectional, logic-seeking carriage control capable of achieving print speeds of 180 char./sec.

The microprocessor-controlled DS180 has a print head that automatically performs high-speed tabs over blank spaces in the text, taking the optimum path to the next printable character, a spokesman said. The unit's throughput is about 500 line/min at 10 char./line and 75 line/min at 132 char./line, with typical text printed at a rate of 200 line/min.

The tabletop printer uses a 9 by 7 matrix to generate the 96-char. Ascii set. Standard features include top-of-form, horizontal and vertical tabs; perforation skip-over; auto line feed; self-test; adjustable forms tractors; and transmission speeds of 110- to 9,600 bit/sec, the spokesman continued. Standard interfaces include RS-232C, current loop and Centronics Data Computer Corp.-compatible parallel.

Printer parameters are said to be programmable by the user from an integral keypad or via the data stream, and a special nonvolatile memory reportedly retains these settings if power should drop. A terminal status panel with a programmable LED display is used for setting the format and performing diagnostic routines.



The Datasouth DS180

Targeted for the serious hobbyist and small business DPer, the printer is noise-dampened for quiet operation and can be fed forms from the front, rear or bottom. The unit costs $1,395, with quantity discounts available.

Although the printer will be sold through a network of independent dealers, additional information on the device can be obtained from the manufacturer at 4740 Dwight Evans Road, Charlotte, N.C. 28210.

Runs at 6,250 Bit/In.

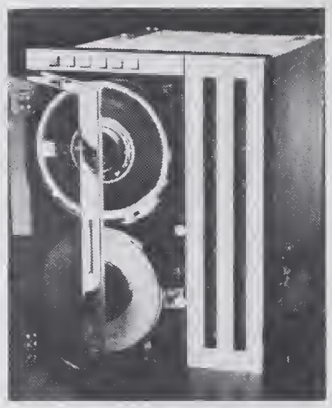
Tape System Fits PDP-11/70

SUNNYVALE, Calif. — System Industries has introduced a magnetic tape storage system for Digital Equipment Corp. PDP-11/70 minicomputers that operates at 6,250 bit/in. and can reportedly be installed without any alterations to DEC's hardware or software.

The Omega system consists of three units: a tape transport, formatter and tape adapter, and is the firm's first entry into the magnetic tape memory systems field.

The tape transport operates at 75 in./sec and is controlled by the formatter. The system records data at 6,250 bit/in. in group code recording (GCR) mode or at 1,600 bit/in. in phase-encoded (PE) mode. In the GCR mode, a standard 2,400-ft reel of magnetic tape can store approximately 100M to 180M bytes of data. However, the unit is switchable and programmable between the two modes, the spokesman claimed.

The system's intelligent tape adapter interfaces the tape transport and formatter to the PDP-11/70 and uses bit-slice microprocessor technology to emulate DEC's TU45 tape system — said to be a slower and lower capacity unit.



Omega Tape System

Four tape transports can operate off a single adapter.

The tape system costs less than $35,000, and shipments are scheduled for the first quarter of this year. Additional details are available from the firm through P.O. Box 9025, 525 Oakmead Pkwy., Sunnyvale, Calif. 94086.

Brochure Focuses On Eclipse Line

WESTBORO, Mass. — Data General Corp. has released a free brochure focusing on hardware, software, peripherals and support for its Eclipse C/150, C/350 and M/600 minicomputers.

"It's the Result That Counts" spotlights the Eclipse in a variety of commercial applications and is available from the company's Communications Services Division, M.S. B-32, 4400 Computer Drive, Westboro, Mass. 01581.

Novas, Eclipses Gain High-Density Storage

WOBURN, Mass. — A high-density magnetic tape storage system for Data General Corp. Nova or Eclipse minicomputers that reads and writes in IBM-compatible tape format has been introduced by Aviv Corp.

The TFS-706 tape system permits users to read or write in 1,600 bit/in. phase-encoded or 6,250 bit/in. IBM-type formats. The system can reportedly store more than 150M bytes on a standard tape reel.

The tape system has on-the-fly, two-track error correction facilities and conforms to both the Ansi X3.39-1973 and X3.54-1976 standards, a spokesman stated.

The entire tape system consists of a 45-, 75- or 125 in./sec tape drive, a formatter, controller and all the necessary cabling. The controller occupies one slot in the Nova or Eclipse computer, provides 4K bytes of first-in/first-out buffer space and can be radially connected to up to eight tape drives. The unit's software is compatible with DG's RDOS and Advanced Operating System.

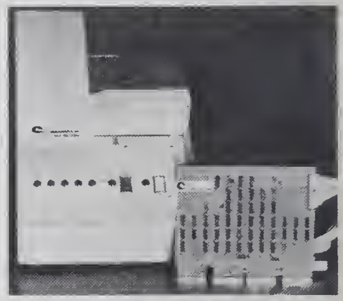
The TFS-706 is priced from $29,200, depending on tape drive speed.

Aviv Corp. is located at 6 Cummings Park, Woburn, Mass. 01801.

Reader for PDP-11s Handles 400 Card/Min

FRAZER, Pa. — Targeted for Digital Equipment Corp. PDP-11 minicomputer systems, Cardamation Co.'s CR400/11 80-column card reader can handle 400 card/-min and is said to be compatible with DEC's software and field engineering diagnostics.

The Cardamation unit is patterned after DEC's CR11 card reader but reportedly offers a 33% performance advantage over DEC's device, which reads about 300 card/min. The unit incorporates a vacuum-feed mechanism to prevent damage to cards that are worn or mutilated and was designed to fit on a table.



CR 400/11 Card Reader

With a PDP-11 interface, the CR400/11 costs $3,980, which is about 75% less than DEC's $7,000 price tag for the CR11, a spokesman noted. Additional information on the reader is available from the firm through P.O. Box 746, Frazer, Pa. 19355.

Disk-Emulating Adapters Built for PDP-11, VAX, LSI

BURLINGTON, Mass. — Xylogics, Inc. has unveiled two disk-emulating adapters that provide users of Digital Equipment Corp. PDP-11, VAX-11/780 and LSI-11/2 and 11/23 processors with up to 5.4 billion bytes of data storage.

The models 650 and 550 controllers emulate DEC's RM02/3, RP04/5/6, RK06/7, RP02/3, RS03 and RS04 disk systems and reportedly provide the user with total software and media compatibility when used with disk drives that have the storage module interface, such as Control Data Corp.'s 9762 unit.

The boards include three-sector buffer storage, error detection and correction capabilities and transfer to 64K bytes without additional latency, a spokesman said. By incorporating bipolar bit-slice microprocessor control, the boards also handle overlapped seeks and dual-port disk drives. Other standard features are direct memory access, throttle control, a built-in two-drive control expandable to eight drives and a power-up self test, he added.

Both models sell for $4,995 each.

Xylogics is located at 42 Third Ave., Burlington, Mass. 01803.

'I've Felt Vaguely Uneasy Since the Guys in Computer Maintenance Took Up Archery.'

ADAPSO

MORE
For Less....
To Make Small....
BIGGER AND BETTER

The Association of Data Processing Service Organizations'
52nd Management Conference

SMALL BUSINESS IN THE 1980's
OUTLINES FOR GROWTH

March 3-5, 1980
Galleria Plaza, Houston, Texas

ADAPSO is the trade association for the computer services industry. We're representing a young and vibrant industry....the industry of today and the future. We know our roots are in small business with its struggles, entrepreneurial spirit and innovative ideas. That's the reason we're getting back to basics; gearing our 52nd Management Conference to small business needs, with lower registration fees and **more** small business program content, to make small....**Bigger and Better.**

Opening the Conference Monday afternoon will be Senator Gaylord Nelson, Chairman of the Senate Select Committee on Small Business. Following Senator Nelson's opening remarks will begin three days of concurrent workshops, committee sessions and presentations covering a variety of subjects including: ***How Software Companies Get into the Service Business, Small Business Administration, Taking an Existing Data Processing Company into the On-Line or Time Sharing Business, Mini/Micro New Business Development, Small Business Marketing and Selling, Advertising for the Smaller Company, Venture Capital, Bank Financing, Introducing a New Product, Going Public, Building a Sales Force, Do I Merge or Sell? When, Where, How?***, and much, much, more!

The Conference will be one you can't afford to miss and early registrants will receive a discount on the registration fee. Send for further information **today**.

Send me more information on the ADAPSO March 3-5 Conference ☐
Send me general information on ADAPSO membership ☐

Name ____________________
Address ____________________ Telephone ____________
City ____________ State ________ Zip ________

Return to: ADAPSO, 1925 N. Lynn Street, Suite 1100, Arlington, VA 22209

Modcomp Units Use Low-, Mid-Range CPUs

FORT LAUDERDALE, Fla. — Modular Computer Systems, Inc. has introduced a number of system packages for its low-end 7810 to mid-range 7830 and 7835 Classic computers that are said to allow users to operate the machines as bases for larger systems or as stand-alone business systems.

The low-end 7810-A10A package is built around the firm's 7810 CPU and MAX III real-time multiprogramming operating system. The setup has 128K bytes of parity memory, a system protect feature and an operator's control panel. A 10M-byte disk drive, included in the package, provides 5M bytes of fixed and 5M bytes of removable disk storage in a standard 56-in. rack. Input functions are performed by a conversational CRT console device, a spokesman said.

The 7810-A10A costs $23,000.

Designed as a mid-range device, the 7830-A10A package features the Classic 7830 CPU with 128K bytes of error-correcting memory, 10M bytes of disk storage and the conversational CRT console. A similar version, designated the 7830-A10B, comes equipped with a hard-copy console device instead of the CRT, the spokesman said. The 7830-A10A costs $33,350 while the A10B sells for $34,150.

Another package based on the 7830 processor, called the A21A, features 128K bytes of error-correcting memory, 21M bytes of fixed media, moving head disk storage and a 9-track, 45 in./sec, 800- and 1,600 bit/in. tape storage subsystem. The NRZI/phase-encoded magnetic tape unit is enclosed in two standard 56-in. racks, and a conversational CRT console included in the $68,800 package price. The system costs $69,600 if a hard-copy console is substituted for the CRT, the spokesman noted.

Additional data storage is provided by the 7830-A67A combination, which is also built around the Classic and MAX III operating system. This package has 128K bytes of error-correcting memory and 67M bytes of removable-media disk storage and costs $54,900.

More Storage

The firm's 7830-B20A package includes the processor and the operating system, but has 256K bytes of memory and 10M bytes of fixed and 10M bytes of removable disk storage.

Geared as a communications processor and integrated communications subsystem, the B20A reportedly offers direct memory access for up to eight asynchronous or synchronous full-duplex channels which can be expanded to 16.

Priced at $83,000 and packaged in three cabinets, the system is supplied with four CRT terminals and one hard-copy device, Modcomp said.

The 7835-A67A package, a mid-range system, utilizes a Classic processor, an arithmetic accelerator, the MAX III operating system with 128K bytes of error-correcting memory and a battery back-up. Storage is provided by a 67M-byte removable media, moving-head drive. The unit costs $57,825.

Finally, the 7835-A10A configuration consists of a mid-range CPU with arithmetic accelerator and 128K bytes of memory. The package has 5M bytes of fixed and 5M bytes of removable cartridge disk storage, a CRT and battery backup. The unit is priced at $37,800.

Modcomp can be reached through P.O. Box 6099, 1650 W. McNab Road, Fort Lauderdale, Fla. 33310.

Two-Day Course Planned by MIC

CHERRY HILL, N.J. — A two-day seminar focusing on business minicomputers will be presented by Management Information Corp. (MIC) on Jan. 22-23 in Houston and at various other times and places throughout the year.

Focusing on the selection and use of business computers, the course will discuss the available hardware and software and how these pieces fit into stand-alone and distributed processing environments.

Other Locations

Besides Texas, the seminar will take place at the company's headquarters here on Feb. 25-26, in Chicago on April 11-12, in New York on June 19-20, in Los Angeles on Sept. 8-9 and in Atlanta on Nov. 20-21. The course costs $315 for current MIC subscribers and $345 for nonsubscribers.

Specific course information and other details are available from the firm at 140 Barclay Center, Cherry Hill, N.J. 08034.

Three-Cassette Course Aimed at DP Novices

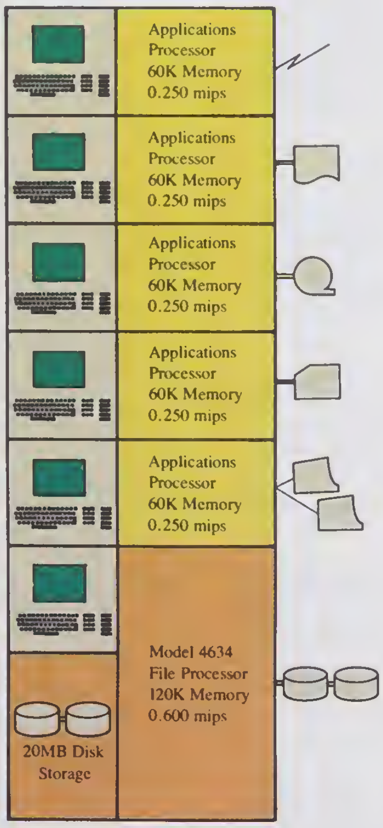
BENTON HARBOR, Mich. — A small business computer course aimed at the professional who knows little or nothing about computers has been announced by the Heath Co.

"Computer Concepts for Small Business" was designed to show executives and DP laypeople how a computer system can reduce a company's costs and increase efficiency, according to a Heath spokesman. The program includes three audio cassettes and uses the audio-tutorial teaching method to guide the reader through text material.

The audio course costs $49.95 from the firm at Benton Harbor, Mich. 49022.

Datapoint will lease you this 420K Computer System for $1,950* a month and ship it in about 12 weeks.

ARCPAC™ gives you mainframe power without mainframe headaches, and costs only $2.21* per user per hour.


Applications Processor 60K Memory 0.250 mips
Applications Processor 60K Memory 0.250 mips
Applications Processor 60K Memory 0.250 mips
Applications Processor 60K Memory 0.250 mips
Applications Processor 60K Memory 0.250 mips
Model 4634 File Processor 120K Memory 0.600 mips
20MB Disk Storage

ARCPAC. 420K memory, 20MB disk memory illustrated here. Each applications processor is multilanguage, multifunction.

Now you can get business computing power with multilanguage and telecommunications capabilities. With easy growth, at reasonable prices, Datapoint has the system for you. We call it the Attached Resource Computer™ system, or ARC™ for short. The major components are proven Datapoint hardware. That's why we can ship you an ARCPAC in about three months with all necessary processors, disks, connecting cables and system software. All at a new, low, packaged price.

The bigger it gets, the better

ARCPAC is a multilanguage, multifunction, multiterminal system for both batch and transaction processing. Any processing work station runs COBOL, RPGPLUS, BASIC-PLUS, DATASHARE® and all Utilities.

The system can grow as your needs increase—simply, easily, in incremental steps, at affordable costs, and without reprogramming. Unlike most large systems, it actually gets better as it grows.

The ARCPAC shown here, for example, can handle 1.85 million instructions per second (mips). Add on another 60K processor and the system's capacity increases to 2.10 mips. A second 60K processor added on brings it up to 2.35 mips. And on and on, almost without limit.

No systemwide failures

Because of its architecture, if part of the system goes off-line, you're still in business. Other parts of the system can simply take over for the off-line processor, or a replacement processor can be quickly plugged into the system. Either way, the system keeps right on working.

The ARCPAC Package

ARCPAC is designed to make it easy for you to get into attached processing. The package comes in two versions: with 20MB of disk storage or, for a little higher price, 120MB. Both packages include five 60K applications processors and one 120K file processor, plus all connecting cables, system software, and languages, at the low package prices.

You have plenty of add-on options to configure the ARCPAC precisely to your needs. These options can include additional processor power, more disk capacity, extra terminals and compatible Datapoint peripherals like printers, magnetic tape drives and others. You have a wide choice of telecommunications systems to make the ARCPAC part of a geographically dispersed network.

The two-year lease rate is $1,950 per month for the basic ARCPAC with 20MB of disk storage. One- and three-year leases are also available. Maintenance is currently $552 per month extra.

Nationwide customer service

Datapoint has 665 Customer Service Representatives stationed in 138 local service offices around the country. Customers call one toll-free number, 24 hours a day, seven days a week, when they need service, and are usually in contact with a service rep in less than an hour.

The Datapoint approach

Datapoint out-thinks its competition to help you out-think yours. ARCPAC is just one of the ways. Datapoint made dispersed data processing feasible and is building now toward the integrated electronic office of the future. Whether you need a hundred small systems for your branch offices or a major computing facility for corporate headquarters, Datapoint has an answer.

For more information on ARCPAC, simply send in the coupon.

*Based on the monthly two-year lease rate with five users and an average of 176 working hours per user per month. Does not include maintenance.

DATAPOINT CORPORATION

TO: Marketing Communications Department (M62)
Datapoint Corporation
9725 Datapoint Drive
San Antonio, Texas 78284
(512) 699-7151

Please send the information indicated below.
☐ ARC system information ☐ ARCPAC
☐ Product family brochure ☐ Annual report

Name
Title
Company
Address
City State C-114 Zip

Attend Telecommunication's

COMMUNICATION NETWORKS 80
Conference & Exposition
January 28-31, 1980
Sheraton Washington Hotel
Washington, D.C.

A-1 NETWORK ARCHITECTURES—DATA VIEWPOINT
- Dr. Dixon Doll, President/DMW Group
- Ray W. Sanders, Chairman of the Board, Chief Executive Officer/Tran Telecommunications Corp.
- Frank Backman, Systems Management/IBM Corporation

A-2 THE INTELLIGENT PBX
- James Gordon, President/TCS Communications Consultants

A-3 COMMUNICATIONS ACT REWRITE: WHERE DO WE GO FROM HERE?
- Richard E. Wiley/Kirkland & Ellis
- Lionel Van Deerlin, Chairman/House Subcommittee on Communications/House of Representatives
- Harrison H. Schmitt/Senate Subcommittee on Communications
- William G. Sharwell, Vice President/AT&T
- Herbert Jasper, ACCT
- William G. McGowan, Chairman of the Board/MCI Communications
- Commissioner Joseph B. Fogarty/Federal Communications Commission
- Ellen Deutch/National Telecommunications Information Administration/U.S. Department of Commerce

A-4 OPTICAL NETWORK ELEMENTS AND DEVELOPMENTS
- Jeffrey C. Hecht, Managing Editor/Laser Focus Magazine Advanced Technology Publications
- Bart Bielawski, Vice President/Siecor Optical Cables
- Brian MacCallum, Elie Project Manager Manitoba Telephone Systems

A-5 SHARING NETWORKS—A USER VIEWPOINT
- Herbert A. Schulke, Vice President/Director of Telecommunications/Chase Manhattan Bank
- John Madar/The Insurance Institute for Research, Inc.
- Jack Sherman, Director of Government and Special Marketing/Satellite Business Systems
- Matthew C. Dillon, Director of Telecom Service/Veterans Administration
- Arnold Kaplan/The American Bankers' Association

A-6 ELECTRONIC MAIL—WHO FILLS THE GAP?
- Dale Hatfield, Acting Associate Administrator for Policy Analysis and Development/National Telecommunications and Information Administration
- The Honorable William F. Bolger, Postmaster General United States Postal Service
- Robert Malson, Assistant Director/Domestic Policy Staff Executive Office of the President
- Stanford B. Weinstein, Counsel for Regulatory Affairs/Graphnet, Inc.
- Ron Wheatley, Computer and Business Equipment Manufacturers Association
- James Wood, Senior Associate/Booz, Allen & Hamilton
- Mary Jo Manning, Esquire, Communications Counsel Senate Committee on Commerce, Science and Transportation

A-7 DISTRIBUTED DATA PROCESSING IN MULTI-FUNCTION NETWORKS
- John L. Kirkley, Editor/Datamation Magazine
- John J. Janis/Data Processing Senior Staff Analyst General Telephone Service Company

B-1 COMPUTER COMMUNICATIONS INQUIRY II
- Prof. Anthony Oettinger, Director/Program on Information Policy/Aiken Computer Labs/Harvard University
- A.G.W. Biddle, President/Computer & Communications Industry Association
- Philip L. Verveer, Chief, Common Carrier Bureau Federal Communications Commission
- Walter Hinchman, Esquire
- Phillip Walker, General Counsel/GTE/Telenet
- Franklin T. Julian/AT&T

B-2 PUBLIC VS. PRIVATE NETWORKS: DESIGN METHODS, TRENDS & TRADEOFFS
- Howard Frank, President/Network Analysis Corporation

B-4 INTELLIGENT NETWORK DIAGNOSTIC AND CONTROL SYSTEMS
- Dr. Alex N. Beavers, Jr., Principal/Booz, Allen & Hamilton
- J. Lightsey Wallace, Assistant Director New Product Development/Atlantic Research Corporation

B-5 TELECONFERENCING: NEW EXPERIENCES
- Ronald Frank, Technical Director/Communication Networks Conference
- Nate Pearlman, Staff Engineering Consultant/Sperry Univac Computer Systems

Doll

Haring

Wiley

McQuillan

Van Deerlin

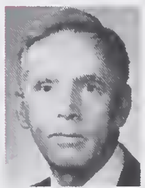
Jewett

Bielawski

Conn

Schulke

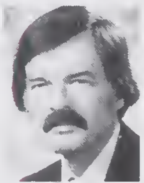
Enslow


Bolger

Bennis

Wood

Groshans


Kirkley

Verveer

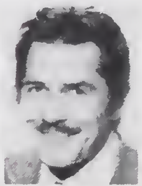
Oettinger

Arlen

H. Frank

Eger

R. Frank


Pouzin

B-6 PLANNING NETWORK NEEDS FOR FUTURE ORGANIZATION STRUCTURES
- Morton Rogoff/Booz, Allen & Hamilton
- Rifaat Dayem, Manager, Private Systems Studies/BNR, Inc.
- Lewis L. Haring, Vice President/Chase Manhattan Bank
- Harry Hershkowitz, Vice President/Chase Manhattan Bank

B-7 WORD ADMINISTRATIVE RADIO CONGRESS: IMPLICATIONS FOR THE U.S. USERS AND VENDORS

C-1 PACKET-SWITCHED NETWORKS—THE ULTIMATE SOLUTION?
- John M. McQuillan,Manager, Systems Analysis/Bolt, Beranek & Newman
- Owen McAleer, Director/Computer Communications Planning/The Computer Communications Group/Trans Canada Systems
- Louis Pouzin, Directeur des Projets Pilotes/IRIA

C-2 NETWORK ARCHITECTURE—VOICE VIEWPOINT
- Dr. James E. Jewett, President/Telco Research Corporation

C-3 INTERNATIONAL NETWORK REGULATORY AND TARRIFF ISSUES
- Brian Moir/House Commerce Committee Staff/House of Representatives
- Robert Conn, Esquire, Executive Vice President/Western Union International
- Lawrence M. DeVore, Assistant General Counsel/Regulatory Matters/COMSAT
- Earl S. Barbely, Common Carrier Bureau/Federal Communications Commission
- Louis Pouzin, IRIA
- Ed Taptich/McKennz, Wilkinson & Kittner

C-4 RURAL COMMUNICATIONS
- Anne P. Jones, Commissioner/FCC

C-5 VOICE RECOGNITION/SIMULATION IN NETWORKS
- George F. Brandt, Jr., Vice President/Dialog Systems, Inc.
- George Glaser, President/Centrigram Corporation

C-6 NEW DEVELOPMENTS IN FRONT END AND COMMUNICATION PROCESSORS
- Prof. Philip H. Enslow, Jr./School of Information and Computer Science/Georgia Institute of Technology
- Greg Burch, Vice President—Technical/Cambridge Telecommunications

C-7 NEW OPTIONS IN SWITCHED VOICE SERVICE
- Robert Bennis, Director of Telecommunications/Westinghouse Electric Corporation
- C. Gus Grant, President/Southern Pacific Communications
- Dean Burch, Esquire/Pierson, Ball & Dowd
- Richard Emerine, Esquire/Earnest & Whinney
- Dr. Nina W. Cornell, Chief, Office of Plans and Policy/Federal Communications Commission
- M. Alan Baughcum/Charles River Associates
- William Betteridge/American Telephone & Telegraph
- Jerry Engel/Satellite Business Systems

C-8 SATELLITE TECHNOLOGY IN THE 1980'S
- Dr. Russell G. Groshans, Division Director, Business Development/COMSAT General Corporation
- Dr. John F. Clark, Director/Space Technology and Applications
- David Sarnoff Research Center/RCA Corp.
- Eugene R. Cacciamani, Jr., Vice President Technical/American Satellite Corporation
- Billy Oliver, Vice President/AT&T Long Lines
- Dr. Robert S. Cooper, Vice President Engineering/Satellite Businesss Systems
- Ervine Goldstein, Vice President and General Manager/International Communiations/COMSAT Corporation

C-9 INTERNATIONAL ELECTRONIC MAIL
- Dr. Jerome Lucas, Senior Scientist/COMSAT
- Mark Funt, Manager of Systems Development/Tymshare

D-1 DATABASE SYSTEMS IN A NETWORK ENVIRONMENT
- Dr. Robert H. Holland, Vice President/DMW Associates

D-2 HYBRID BROADBAND NETWORKS: SATELLITE, MICROWAVE AND CABLE
- Gary Arlen, Editor, Satellite News/Phillips Publishing Co., Inc.
- Robert Button, President/TransCommunications Corp.
- Ed Taylor, President/Satellite Syndicated Systems Inc.
- Carver Washburn, V.P.-Business Development/Western Union

D-3 INTERNATIONAL PROBLEMS IN TRANS-BORDER DATA FLOW
- John Eger, Esquire/Lamb, Halleck & Keats
- William L. Fishman, Esquire, Director of Office Planning and Policy Coordination/National Telecommunications and Information Admin.
- Philip C. Onstad, Manager, Telecommunications Policies/Control Data Corp.
- Morris Crawford, Director, Office of Bilateral and Multi-National Science and Technology Affairs
- William Lilley, III, V.P.-Government Affairs/American Express
- Louis Pouzin, IRIA

Largest Program!

January 28-31, 1980
Sheraton Washington Hotel
Washington, D.C.

D-4 LIMITED DISTANCE NETWORKS
Robert Rosenthal, Project Manager/Local Area Networking National Bureau of Standards
Stephen C. Lang/Senior Marketing Manger, Communications Fiberoptics/Valtec Corporation
Wushow Chou/North Carolina State University
Joseph Scarpa, Vice President, Marketing/Penril

D-6 NETWORK BASED HOME INFORMATION SYSTEMS
John Bartlett/Kirkland & Ellis
William Von Meister/GTE/Telenet
Gustave M. Hauser, President/Warner Cable Corp.
Jack Taub/TCA
Robert Ryan, President/Telecomputing Corp. of America
Arch Madsen, President/Bonneville International Corp.
Haines Gafner, President/Link, Inc.
Robert Sandford/Texas Instruments

D-7 INTERNATIONAL VOICE/DATA NETWORKS MANAGEMENT
William C. Brasuell, Director of Communications/Fairchild Semiconductor
Ken Gross, Vice President/TRT Communications
Louis Pouzin, Directeur des Projets Pilotes/IRIA

E-1 ELECTRONIC MAIL AND MESSAGE SYSTEMS—INTRODUCTION AND OVERVIEW
Howard Anderson, President/The Yankee Group

E-3 MODEMS, MULTIPLEXORS & CONCENTRATORS—TRENDS IN THE 80'S
Richard L. Deal, President/R.L. Deal Associates
Arthur Lynch, Director/Network Products/Codex

E-4 INTELLIGENT PBX'S IN ELECTRONIC MAIL
Joan Ross, Director, Automated Business Comm. Program International Data Corp.

E-5 THE ALL-DIGITAL NETWORK: IS IT HERE YET?
Mr. Joseph A. Sciulli, President/Telecommunications Techniques Corporation
Howard Berkowitz/CRC Systems
John Nuwer, Manager, Planning and Evaluation/Corporate Electronics and Telecommunications Dept.
Robert Aaron/Bell Telephone Labs
Gene Gabbard, Vice President/Digital Communication Corp.

E-6 INTEGRATING ADMINISTRATIVE NETWORKS: ADVANCED CONCEPTS
James H. Carlisle, President/Office of the Future, Inc./
James Bair/Bell Northern Research

7/10 FACSIMILE NETWORK TECHNOLOGY
George M. Stamps, President/GMS Consulting

8/11 DISTRIBUTED AND COMMUNICATING WORD PROCESSORS
Dale Kutnik, Vice President/The Yankee Group

9/12 CARRIER, SERVICE AND TURNKEY EM/MS
Kenneth Bosomworth, President, IRD Editor, EM/MS Newsletter/International Resource Development, Inc.
Linda J. Shine, Associate Consultant, Inc.

F-1 NETWORK ACCESS DEVICES: ASSURING TRANSPARENCY
Jeffrey A. Bloom, Director of Information Systems Studies, Washington Operations/Network Analysis Corporation

F-2 CARRIER SELECTION AND TARIFF ANALYSIS TECHNIQUES
Jacqueline B. Shrago, Vice President/Telco Research Corp.

F-3 EM/MS IN MANUFACTURING
John Callahan, Principal/Concord Consulting Group

F-4 EM/MS IN BANKING
Thomas A Hannigan, Vice President and Manager, Office Automation/Continental Illinois National Bank

F-5 EM/MS IN PROFESSIONAL SERVICES
John Myrna, Vice President/Scientific Timesharing

F-6 EM/MS IN INSURANCE/GROUP RECORD TRANSACTIONS
Gerald Maskovsky, Director, Office of the Future/Coopers & Lybrand

F-7 EM/MS IN FEDERAL GOVERNMENT AND ARMED FORCES
Marriane Oldfield, Management Analyst, Administrative Management Directorate/Adjutant General Center/Army

F-8 EM/MS IN TRANSPORTATION/UTILITIES
Dr. David R. Lockwood, Manager, Automated Office Communications/General Telephone

F-9 THE INTELLIGENT SWITCHING SYSTEM
Roy Layton, Director of Communications/Allstate Insurance
John Morrison, Midwest Territory Communication Manager Sears, Roebuck & Company
Robert Kern, Asst. Director of Student Services/South Common/Ferris State College
Ed Tryka, Manager, Network Telecommunications/Burroughs Corporation

Chou

Tryka

Gafner

MacGahan

Brasuell

Kleinrock

H. Anderson

Eng

Sciulli

Wohl

Carlisle

Geller

Shine

McGill

Shrago

Fthenakis

Myrna

Griesinger

Layton

Hollings

F-10 SECURITY AND ENCRYPTION HARDWARE
Dennis Branstead/National Bureau of Standards
Aileen MacGahan, Consultant/American Express

F-11 TRANSPARENT NETWORK APPLICATION PACKAGES
Leonard Kleinrock, School of Engineering and Applied Science University of California at Los Angeles
Arthur Lynch, Network Products/Codex
Jon C. Wilson/Evergreen Consulting

G-1 PLANNING AND SYSTEMS ENGINEERING FOR EM/MS NETWORKS
Jerry Eisen, Managing Consultant/International Telephone & Telegraph

G-2 EM/MS ECONOMICS AND USER CHARGEBACKS
William Whiten, Manager of Information & Office Systems Owens-Corning Fiberglas Company

G-3 COMPARING CARRIER/SERVICE EM/MS
Frank Eng/Booz, Allen & Hamilton

G-4 DEVICE STANDARDS AND INTERFACES ON EM/MS NETWORKS
Marc Seriff, Director of Network Services/GTE/Telenet

G-5 GETTING STARTED IN EM/MS VIA COMMUNICATING WORD PROCESSING
Amy D. Wohl, Principal/Integrated Technologies, Inc.

G-6 USER IMPLEMENTATION IN EM/MS
Robert Erickson, Manager, Office Information Systems/Digital Equipment

S-1 TOWN MEETING—TECHNOLOGY OF THE 1980's: REGULATORY ASPECTS
Richard E. Wiley, Esquire/Kirkland & Ellis
Henry Geller, Assistant Secretary for Communications and Information/National Telecommunications and Information Administration/U.S. Department of Commerce
Harry M. Shooshan, III, Associate Counsel/House Subcommittee on Communications/House of Representatives
Herbert Jasper, Executive Vice President/Ad Hoc Committee for Competitive Telecommunications
Arch McGill, Vice President/AT&T
Tyrone Brown, Commissioner/Federal Communications Commissior
Robert Hall, President/Satellite Business Systems
Joseph Charyk, President/COMSAT
Eugene F. Murphy, President/RCA Global Communications
Emanuel Fthenakis, President/American Satellite Corporation

S-2 FUTURISTS SESSION: PANEL ON THE FUTURE OF THE NETWORK AGE
Ronald A. Frank, CN'80 Technical Program Director
Prof. Ithiel de Sola Pool, Director, Center for Policy Alternatives Massachusetts Institute of Technology
Louis Pouzin, Directeur des Projets Pilotes/IRIA
Dr. Lawrence Roberts, President/GTE/Telenet
Frank Vigilante, Project Director, Advanced Communication Service/AT&T Business Marketing Dept.

S-3 BRIEFING/TOUR OF THE PAPERLESS OFFICE

S-4 HOW TO SELL EM/MS SYSTEMS IN THE 1980'S
James H. Carlisle, President/Office of the Future, Inc. The Galaxy
Robert S. Anderson, Vice President and Director of Research Martin Simpson Research Assoc., Inc.
D. Roger MacNaughton, President/Business Development International
Frank K. Griesinger/Frank Griesinger & Assoc.

R-1 CONTROLLING NETWORK COSTS
Harry Newton, President/The Telecom Library

R-2 HOW TO SURVIVE AS A TELECOMMUNICATIONS MANAGER IN THE 80'S
Harry Newton, President/The Telecom Library

R-3 MIXED VENDOR NETWORK MANAGEMENT
James Gordon, President/TCS Communication Consultants

R-4 HOW TO GROW YOUR OWN TELECOM PROS
Thomas C. Mullaney, Vice President/MCI Telecommunications Corp.
Gerald Goldstone, Editor/Business Communications Review

R-5 GETTING THE OFFICE MAIL ROOM READY FOR EM/MS
Frank K. Griesinger, President/Frank K. Griesinger and Associates, Inc.
Thomas A Hannigan, Vice President and Manager, Office Automation/Continental Illinois National Bank

FEATURED LUNCHEON SPEAKER: Senator Ernest F. Hollings of South Carolina. He is one of the Senate's leading experts on communications technology and is Chairman of the Commerce Subcommittee on Communications.

Register by phone and save $50!

Call Communication Networks '80 at 800-343-6200 (In Mass. 617-964-4550)

CN'80 is produced by The Conference Company, 60 Austin St., Newton, MA 02160 Conference Director—William R. Leitch/Gen. Chairman—Richard Wiley

Patient Tracking Aids General Practitioner

Special to CW

OSNABRUCK, Germany — In the medical profession, computers "should neither replace the doctor nor the medical diagnosis" and should help, not hinder, the day-to-day activities of a doctor's practice.

While these two rules may seem like modern-day additions to the medical profession's traditional Hippocratic oath, they are actually the guidelines used by German urologist Dr. Rolf Ruschemeyer, in developing a mini computer-based patient tracking and accounting system for general practitioners.

Geared to operate on a Data General Corp. Nova 4 minicomputer, the turnkey system stores the personal details of each doctor's patient such as name, address, office visit record and diagnosis. The system can also be used for word processing, since it generates a variety of form letters, and can juggle standard billing and payment chores, a spokesman said.

Aided by a number of his medical colleagues and an assortment of hardware and software experts, Ruschemeyer founded MED EDP GmbH, the firm that markets the specialized computer package. However, before the system — called Pro-Med — was introduced to the general public, he tested it on his own 150-patient operation.

Individual Check-Cards

Programmed in Basic and able to accommodate a number of terminals, the system monitors a doctor's work load and files by issuing each patient an individual check-card and control number.

When a patient enters the doctor's office, personal details and diagnoses are input to the computer via a CRT terminal, and a slip is printed out. The slip shows the daily control number for that particular patient, the spokesman said.

Should several consultations be necessary during a visit, the patient is given a preprinted check-card immediately at registration. Approximately 800 different possible medical services are included on this card, the appropriate one simply being checked off after it has been carried out.

Not only do the cards minimize the data preparation work load when registering patients, but they can be easily stored on the Nova 4 using an automatic reader attached to the computer, the spokesman explained.

The doctor carrying out treatment calls up the patient's medical listing using his CRT screen. He can input medical data either in free text form or with alpha codes for text elements or complete blocks of text. The letter codes are easy to understand — for example, K for kidney, P for pelvis or PC for pelvic cavity.

Complete code structures can be built up from the individual codes. Pathological conditions can also be specified in the same way. Reports and accounts are automatically produced from the diagnosis file, the spokesman continued.

Cost Savings

According to Dr. Ruschemeyer, the Pro-Med system can eliminate many of the costs associated with running a medical practice. For example, experience shows that between 5% and 10% of quarterly bills are simply forgotten.

A further saving in practice administration is brought about by automating the writing of doctors' letters. The individual diagnoses merely need to be called up using their respective codes. The remaining text of the letter is already stored in the Nova 4.

Finally, the system includes a number of maintenance programs that cover the necessary administrative duties common to any business.

MED EDP has branches in Essen, Frankfurt and Osnabruck, Germany.

HP System For DP Novices

(Continued from Page 73)

porates a set of user-definable function keys as well as the standard typewriter keyboard and numeric keypad.

To reproduce CRT-displayed data as hard copy, the HP-85 provides a thermal printer that produces 32-column output at 64 char./sec. The integrated unit prints a 128 Ascii character set bidirectionally and operates unidirectionally in graphics mode.

A built-in tape drive system, meanwhile, stores up to 210K bytes on one HP data cartridge and reads or writes at 10 in./sec. The unit also transfers 650 bytes/sec and searches at 60 in./-sec, the spokesman said.

The HP-85 currently provides a choice of seven prerecorded application packages, with another eight such programs already under development. Packages available now cover Basic language training, general statistics, mathematics, electrical engineering, finance, linear programming and regression analysis.

Each prepared program is written in an Ansi-standard Basic that reportedly provides 12-digit accuracy and 42 predefined functions. To simplify programming, the language also offers 146 commands, twice as many as with rival personal computers, the source claimed.

In a basic configuration, the system costs $3,250, with extra memory priced at $395 per 16K-byte increment. Deliveries of the HP-85 begin immediately from HP at 1507 Page Mill Road, Palo Alto, Calif. 94304.

Beehive's family of custom OEM terminals

proven hardware! plug-in software!

MODULAR CONSTRUCTION

Micro B Model DM1A
EXPANDED CONVERSATIONAL
14 Key Numeric Pad, Line Drawing,
Video Attributes,
128 ASCII Character Set

Micro B Model DM20
EDITING
Full Editing Features,
Buffer Transmission Modes,
Expanded Keyboard
with 16 Function Keys

Micro B Model DM30
ADDITIONAL MEMORY
All features of the DM20
plus 8K RAM Two Page Capability,
Parallel Printer Port, Beehive's
B300 Characteristic Emulator.

Call for applications assistance and delivery
TOLL FREE USA (800) 453-9454

CALIFORNIA Costa Mesa (714) 540-8404 TWX 910-595-2572 • Sunnyvale (408) 738-1560
FLORIDA Altamonte Springs (305) 830-4666 ILLINOIS Arlington Heights (312) 593-1565
MASSACHUSETTS Woburn (617) 933-0202 NEW YORK New York (212) 682-2760 UTAH Salt Lake City (801) 355-6000
VIRGINIA Falls Church (703) 356-5133
EUROPE Amsterdam, The Netherlands Phone 020-451522

BEEHIVE INTERNATIONAL
"A proven competitive manufacturer of smart terminals"

It's Just Too Expensive There

Silicon Valley Hit by Vendor Exodus

By Marcy Rosenberg
CW Staff

California, here they come — and away they go.

Bay Area-based computer equipment and semiconductor manufacturers are beginning to expand outside the economically rich Silicon Valley they created and often outside California itself — because land costs too much, the housing supply and public transportation and highway facilities fall short of a high rate of job growth and, as a result, personnel recruitment and retention is too difficult and expensive.

The cost of homes in Santa Clara County — their median price is $97,000 — ranks about the highest in the nation and continues to escalate. In a recent speech to the Stanford University Graduate School of Business Alumni Association, John A. Young, president and chief executive of Hewlett-Packard Co., broke out some of these costs.

In San Jose, the cost of the average home rose from $33,000 in 1973 to $92,000 in 1979; the typical Palo Alto home costs about $150,000, up from $56,000 since January 1976.

Compounding these soaring costs is a serious housing shortage, created in large part by "virtually unconstrained" economic and job growth in the South Bay Area, Young stated.

He quoted Building Industry Association findings that in Santa Clara County today, there are 31,000 too few housing units, with a vacancy rate of only 1.7%.

While most local firms intend to keep corporate headquarters in the valley — which includes the communities of Palo Alto, Mountain View, Sunnyvale, Santa Clara and Cupertino — they plan to direct new manufacturing efforts elsewhere.

For example, half of Santa Clara County Manufacturing Group's 51 members, mostly electronics firms, plan to set up new facilities outside California. One member, HP, is targeting seven new manufacturing plants, only one of which will be located in the state.

Task Force Recommendations

HP, through the Manufacturing Group, is one of several electronics firms that participated in a recent study by the Santa Clara County Industry and Housing Management Task Force to identify the valley's growth-related problems. The task force outlined a plan for curbing industrial expansion in the area [CW, Nov. 19] and urged local high-technology firms to comply with its recommendations, including:

- Locating future plants outside the valley whenever possible.
- Controlling business expansion in localities with insufficient housing.
- Cooperating with the public and private sectors to provide affordable housing.
- Shifting employment to job-poor cities and away from job-rich areas.
- Limiting existing industrial areas to their current job density.
- Funding transportation projects.

Pooh-poohing the task force findings regarding the job/housing imbalance in the valley as "a reiteration of what we all know," many local firms claim to already have taken steps to ease the area's housing and transportation crunch and to cut their own expenses.

HP, for one, selected sites outside the region for new manufacturing facilities in various stages of development: one leased plant operating in Roseville, Calif., to expand Data System Division production of terminals and disk drives; three Washington sites including a temporary facility in Vancouver that will manufacture printing terminals; options on land in Raleigh, N.C., and Greeley, Colo., and one leased facility in

(Continued on Page 84)

Ramtek Sets Financial Goal: Tenfold Revenue Gain by 1984

By Jeffry Beeler
CW West Coast Bureau

SANTA CLARA, Calif. — Even by computer industry standards, Ramtek Corp. has set lofty financial goals for itself. By 1984 — 1985 at the latest — Ramtek plans to top the $150 million mark in annual revenues, according to Chairman and President Charles McEwan.

Can a firm that grossed only a comparatively modest $15 million in fiscal 1979 reasonably expect to multiply its sales tenfold in just five or six years?

In most industries, the answer would be a resounding "No!" But in the rapidly expanding computer graphics field, Ramtek's specialty, grandiose growth schemes are not so easily dismissed.

Consider the facts. Between 1978 and 1979 alone, the computer graphics market nearly doubled to an estimated $1 billion. During the next five years, expansion is expected to continue at a steady 25% to 30% per year.

What's more, in the raster-scan sector, where Ramtek's main business interests lie, the market is growing even more rapidly at 35% to 40% per year, McEwan said.

A market with such a vast growth potential makes Ramtek's management strategy fairly simple to formulate. All the company needs to do to reach the $150 million sales plateau by the mid-1980s, McEwan explained, is to maintain a consistent 10% to 15% share of the available business in its field. Then, every time the market expands, Ramtek's sales will automatically do likewise at approximately the same rate.

Whether the company will be able to meet its near-term growth objectives will depend in large measure, the Ramtek chief said, on its ability to position itself strategically in the computer graphics marketplace.

No firm can possibly hope to excel in every facet of that market, nor should it try, McEwan asserted. So the key to continued growth, at least in Ramtek's view, is to concentrate on a few market sectors with the strongest growth promise and then strive to dominate those sectors.

For the moment, the firm's activities in the computer graphics field stress four main applications — process control, computer-aided design, medicine and the military. Commercial applications currently account for only about 5% of Ramtek's total sales,

(Continued on Page 80)

CBN's Drohan Dead at 46

WEST ORANGE, N.J. — Funeral services were held Monday, Dec. 24 at St. Joseph's Church here for John Francis Xavier Drohan, executive editor of *Computer Business News* (CBN).

Born March 8, 1933 in Iselin, N.J., Drohan grew up in New York City. Starting as a copy boy at the *New York Daily News*, he held management positions with Fairchild Publications, McGraw-Hill and Cahners Publications during his 22-year career as a newsman.

Drohan joined CBN in December 1978, shortly after it was established, and served as its first managing editor. He was promoted to executive editor in July. CBN is published by CW Communications, Inc., publishers of *Computerworld*.

Drohan became ill last August and was hospitalized in New York and later in New Jersey. He died Dec. 21 at St. Barnabas Medical Center, Livingston, N.J.

Drohan was married to the former Catherine A. Mooney. The couple had two children, Patricia and Amy.

Burial was at Restland Memorial Park, East Hanover, N.J. Donations in his memory may be sent to Mother Theresa, Calcutta, India.

Began as Copy Boy

Except for some time spent in the U.S. Army in Germany during the Korean conflict, when he was a reporter for *Stars and Stripes*, and a five-year period in Boston while he was employed at Cahners, Drohan spent all his life in the New York area. He attended St. John's University and received his B.S. in history from the State University of New York.

Drohan began his news career in a time-honored fashion — as a copy boy, city desk

(Continued on Page 84)

Memorex's Dobbie Going to Avantek

SANTA CLARA, Calif. — James Dobbie, executive vice-president of Memorex Corp., has resigned to become president and chief operating officer of Avantek, Inc.

Dobbie, who joined Memorex in 1975, has been a member of Memorex's Office of the President for the past two and one half years. His resignation is effective tomorrow.

A Memorex spokesman did not know who would succeed Dobbie or whether the vacated post would be filled at all.

Two analysts contacted shortly after the announcement expressed surprise at the resignation, but agreed the chief operating responsibility at Avantek would be a challenge. While the analysts did not wish to speculate on Dobbie's resignation, industry observers have maintained for some time now that Memorex is for sale.

Avantek, which specializes in microwave and semiconductor products, is currently a favored company among institutional investors, one analyst pointed out. Since going public in November 1978, its stock has advanced from $14 to $45 per share.

Avantek's sales for 1979 were $39.8 million and its backlog was about $31.6 million.

Lawrence R. Thielen, formerly president and chairman of Avantek since its founding, now becomes chairman and chief executive officer. He recommended to Avantek's board of directors that the new post be added to broaden the management of the firm and ensure growth during the 1980s.

Modcomp Sells 25% to West German Firm

FORT LAUDERDALE, Fla. — Modular Computer Systems, Inc. has completed transactions with AEG-Telefunken whereby Modcomp will receive $30 million in cash in return for issuing the West German electronics firm 25% of its common stock.

Under the arrangement announced last October, Modcomp will issue 1.089 million shares of previously authorized but unissued common stock. Three nominees of AEG-Telefunken have been elected to Modcomp's board of directors, increasing the size of the board from nine to 12 members.

In addition, a joint venture company, 75% owned by AEG-Telefunken and 25% owned by Modcomp, will be formed in West Germany. Modcomp will pay $2 million in cash for its interest in the venture.

For a nominal amount, the venture will purchase the assets and liabilities of Modcomp's West German subsidiary, which is reportedly not profitable.

The two firms have concluded arrangements relating to the sale of Modcomp computer systems to the joint venture firm, the exchange of technological developments in the computer field and the licensing of some of each other's products.

Earlier the firms said they would concentrate on developing real-time process control applications, marketing them in Germany, Switzerland, Austria and certain eastern European countries.

Commenting on the completion of the agreement, Alexander W. Giles, Jr., president and chief executive officer, said, "The infusion of an additional $30 million in equity should put to rest any questions concerning Modcomp's financial condition."

AEG-Telefunken was one of the four firms that last year expressed an interest in acquiring part or all of Modcomp.

For the first nine months of fiscal 1979, Modcomp had revenues of $52 million and earnings of $1.04 per share. In 1978 the firm's total revenues were $64.5 million and earnings were $4.4 million or $1.36 per share.

A company spokesman said he has heard the Securities and Exchange Commission has completed its investigation of the firm's accounting practices, but the firm has received no indication of the results of the investigation.

Financial Goals High at Ramtek

(Continued from Page 79)

but during the next few years the company president foresees that share growing to as much as 40%.

McEwan, indeed, expects business applications to emerge soon as a major new revenue source for manufacturers of computer graphics terminals, particularly those whose products, like Ramtek's, display information in color.

Accordingly, the firm is said to be readying its first commercially oriented color graphics system for introduction in about six months.

Behind McEwan's decision to intensify his firm's activities in the commercial sphere lies a firm belief that computer graphics, particularly color graphics, is at last beginning to ripen into a mature field. His views recently received strong confirmation from the utlimate arbiter of DP market trends — IBM itself.

Only last month, the industry giant announced its first color display terminal, the Model 3279, and in so doing gave the $200 million color graphics market its tacit stamp of approval, the Ramtek chief said.

To pave the way for its upcoming product ventures, Ramtek has traditionally reinvested 12% of its total annual revenues in research and development. But as a privately held firm growing at about 40% per year, Ramtek found itself increasingly hard-put to finance its expanding product development efforts.

So last December, almost seven years after its founding, the company went public in an attempt to meet its sizable capital investment needs, McEwan said.

IBM Broker/Vendor Buys Back Stock

CHICAGO, — Forsythe McArthur Associates, Inc., a broker and vendor of IBM equipment, has repurchased 50% of its outstanding common stock.

The seller is James D. McArthur, a co-founder of the company who served as chairman and treasurer until his resignation Jan. 3. McArthur will pursue venture capital and real estate investments.

The firm will retain its original name.

California Firm Sets French CAI Venture

PALO ALTO, Calif. — Computer Curriculum Corp., a supplier here of turnkey systems for computer-assisted instruction (CAI), has formed a joint venture with Compagnie Generale D'Informatique, a French software development firm.

The new firm, named Didac, will market Computer Curriculum's turnkey systems and develop computer-aided basic skills courses.

The French Ministry of Education is interested in CAI courses in reading, mathematics, English as a second language and programming languages.

NOTICE
FEDERAL RESERVE SYSTEM
FRCS-80 PROJECT DIRECTORATE
REQUEST FOR PROPOSAL

The Federal Reserve System provides a number of services for its member banks, certain federal government agencies, and the public through the communication of financial transactions and data. Projections of the future communication requirements of the Federal Reserve System indicate that the current networks should be replaced with a general purpose, state-of-the-art distributed packet-switched network. This successor communication capability is referred to as FRCS-80 (Federal Reserve Communication System after 1980).

Based on a thorough marketplace survey and the development of a procurement policy for FRCS-80, the Federal Reserve System has decided to package the FRCS-80 procurement into at least five independent RFPs.

For ease of reference, the RFPs are being identified as RFP-1 through RFP-5. The distinct FRCS-80 elements being procured through the five RFPs and the tentative schedules for their release and response are:

RFP-1: Release on December 17, 1979 — Response Due on March 28, 1980

Transport Network

The basic packet-switching transport network will initially consist of a network management center (NMS) at Culpepper, Virginia and 14 functionally equivalent node configurations located at each of the 12 Federal Reserve Banks, the Board of Governors, and the NMC. A fifteenth complete node configuration will be required for testing. Based on future traffice requirements, additional nodes may eventually be installed at other locations. Vendors will also be required to bid on the option of integrated technical control equipment.

The nodes will utilize the Federal Reserve System X.25 Standard for all user connections. Vendor-defined interfaces and protocols may be used for internal transport network operation.

To the maximum extent possible, the Federal Reserve System desires to avoid custom development and to procure a complete packet-switching transport network from the standard product line of a single vendor.

As a requirement for final acceptance of the transport network, the custom interfaces, encryption devices, circuits, technical control equipment, and link interface devices (described below) must be integrated with the transport network. Accordingly, the transport network vendor will be required to assist the Federal Reserve System by reviewing specifications and integrating those elements with FRCS-80.

RFP-2: Release on March 7, 1980 — Response Due on May 2, 1980

Custom Interface

These custom interfaces will convert between the existing Federal Reserve standard binary synchronous computer to computer protocols and the X.25 Standard required by the FRCS-80 transport network. The custom interfaces may be a software adaptation of existing front-end processor equipment or discrete special-purpose components.

RFP-3: Release on August 1, 1980 — Response Due on October 24, 1980

Encryption Devices

Physically distinct encryption devices will be required to implement encryption from source to destination node within the transport network and for link encryption for all remotely attached terminals and computer systems. The NBS DES algorithm (see FIPS Pub. 46) will be used for all encryption in FRCS-80.

RFP-4: Release on September 2, 1980 — Response Due on November 7, 1980

Link Interface Devices

These will be modems or digital access units as required for each FRCS-80 circuit.

Circuits

The elements of FRCS-80 will be interconnected via high-speed dedicated digital circuits. These circuits will be augmented under node software control by demand-acquired and usage-charged transmission services to supplement and provide back-up for the dedicated circuits.

RFP-5: Release on February 6, 1980 — Response Due on May 1, 1980

Host Computer Interface

Host computer systems in Federal Reserve offices and authorized financial institutions will eventually require this interface to communicate with FRCS-80 using the Federal Reserve System X.25 Standard. Currently, the major host computer vendors for the Federal Reserve System are IBM and Burroughs. Interfaces for other vendor hosts will be acquired in the future as required.

Terminal Interface Processor (TIP)

These devices will provide access to the network for terminal (non-X.25) devices by translating between the terminal and the transport network protocols. The TIP will provide various hardware and/or software modules to implement a network virtual terminal and accommodate a variety of terminal units.

The same vendor may respond to any number of RFPs. Each RFP will be an independent document containing *all* the information necessary for vendor responses to that RFP.

Vendors who *seriously intend* to respond to one or more RFPs may add their name to the distribution list by forwarding the following information:

1) Name of Corporation
2) RFP(s) for Which a Copy Is Requested
3) Address To Send RFP(s) To:
   a) Name of Primary Contact
   b) Address
   c) Telephone Number

To:

Mr. Ronald C. Hostad
Secretary — FRCS-80 Project Directorate
Federal Reserve Bank of Minneapolis
250 Marquette Avenue
Minneapolis, Minnesota 55480

Own Computer Expected This Year

DP Market Growth Steady in Southeast Asia

By Bohdan Szuprowicz
Special to CW

The rate of growth of Southeast Asia's DP industry has been estimated at 25% to 30% annually by the Hong Kong publishers of *Asian Computer Yearbook*, who keep track of developments in that mosaic of countries that exists between India, Japan and Australia.

These include Hong Kong, Singapore, Indonesia, Malaysia, the Philippines, Thailand and Taiwan, which constitute the primary markets for DP, although occasional computers are also found in more remote places like Burma, Bangladesh, New Guinea, Nepal and Vietnam.

The Southeast Asian computer industry is maturing now to a point where the first computer designed and manufactured in the region is expected to make its appearance during 1980. The area already has its own Southeast Asian Regional Computer Confederation (SEARCC).

SEARCC is gearing up for its third international conference, planned for Jakarta, Indonesia, during the latter part of 1980.

Big Market

With about 1,600 computers already installed, the region presents a bigger market than all of Africa (excluding South Africa) or the Arab states, whose imports and office equipment have been growing faster than any other part of the world. Although in hardware imports alone Southeast Asia markets have not grown as fast as some other DP markets, the region has an advantage in already being a manufacturer and exporter of electronic components and subassemblies, many of which end up in computer and peripherals hardware produced in the West and in Japan.

Singapore, for example, is steadily increasing its exports of computing and office equipment products, which reached over $80 million in 1977, giving it a healthy trade surplus over imports of such equipment during the same period of time. West Germany and the U.S. are the biggest export markets for Singapore; together, they account for more than $50 million of all exports from the city-state.

Malaysia, Japan and the UK are also significant importers of Singapore products in these categories.

Hong Kong is also an exporter of such hardware, but it imports more than it exports and has a net trade deficit in these products. The U.S. and West Germany are the largest export markets for Hong Kong, but the overall export levels from Hong Kong have been falling recently; at about $50 million in 1977, they are lower than those of Singapore.

Both Hong Kong and Singapore as well as other Asian "off-shore" suppliers are now threatened by a rapidly growing production of such products in Ireland.

In Southeast Asia, Hong Kong is the largest computer user of the region with at least 550 machines identified in the latest installation census. While many of those are small systems of the Wang Laboratories, Inc. 2200 and Datapoint Corp. 5500 variety, nevertheless this type of installation is rather common in that part of the world.

As a result, Hong Kong has more than 300 computers of all types available per million of its nonagricultural labor force. This is far from about 2,000 for U.S. or even almost 1,000 in Japan, but it is somewhat better than the Soviet Union and much better than China itself.

The Philippines, with more than 300 systems, has the next largest number of computers in Southeast Asia. However, its population is very much larger; as a result, its computerization level is only 49 computers per million of nonagricultural labor.

But this is not the lowest for the region by any means. In Indonesia, where there are only about 120 computers, the computerization level is down to six million, comparable to that in India and Sri Lanka.

IBM Leading Supplier

Analysis of hardware in use in Southeast Asia shows that IBM is leading all other suppliers, but not with the overwhelming market share often seen in North America or Western Europe. IBM has a 24.5% market share by number of installations in the region.

In total value of installed equipment, IBM is considerably further ahead with about 50% of the total because many of its installations are large systems with numerous peripherals, including some large 30 series installations.

NCR Corp. is next with 14.5% of all computers installed in the area, followed by Wang with 13.6%, Data General Corp. with 9.1%, Digital Equipment Corp. with 8.1% and International Computers Ltd. (ICL) with 7.3% of the total.

Burroughs Corp. with a 6.1% share is next, but strangely it is well represented only in Hong Kong and the Philipines.

Univac has a 3.6% share of the total, while Control Data Corp. has a major presence in Thailand.

FUTURE SYSTEMS FORUM II

1980's SCENARIOS FOR THE IBM H SERIES AND OTHER LARGE SCALE SYSTEMS, SOFTWARE, TELECOMMUNICATIONS, AND OFFICE AUTOMATION.

Which vendor? Which product? Upgrade? Purchase or lease?... These are the kinds of decisions awaiting you at the dawn of the 1980's. But on March 3rd, 4th and 5th you can prepare for them at FUTURE SYSTEMS FORUM II in Scottsdale, Arizona.

FUTURE SYSTEMS FORUM II presents another in-depth program to analyze and forecast new products, new software and services and new technologies for the '80s. You will hear top speakers representing some of the leading large scale manufacturers and users from diverse industries. Companies like Exxon, GE, IBM, Motorola, Nippon Electric, Texas Instruments, Satellite Business Systems and Electronic Data Systems, among others.

You'll get a wide range of vital information and projections on the '80s. The kind of accurate forecasting heard at last year's Forum, such as 303x pricing, IBM's Newport series and memory price trends.

FORUM II's agenda includes crucial topics and issues, particularly the anticipated IBM H series, software trends, telecommunications and office automation, their impact on the information systems industry, competitors and users.

At FUTURE SYSTEMS FORUM II you will hear opinion with fact. Of course. However, you'll dissect opinion because we intend to spark thought and generate controversy. Among audience and panel of computer professionals will be "advocates" and "adversaries" defending and disagreeing with each speaker to get the sharpest, most accurate perspective of this decade.

We said it before: ANYONE WHO MUST KNOW WHERE THE COMPUTER, COMMUNICATIONS AND SOFTWARE INDUSTRIES ARE HEADED DURING 1980 AND BEYOND MUST ATTEND.

A limited number of spaces are available to insure a more personalized service to attendees.

Keynote speaker, Charles P. Lecht, President, Advanced Computer Techniques Corporation and author of *The Waves of Change*.

Special film report from Herman Kahn, Director and Chairman of the Hudson Institute and author of *The World Economic Development*.

SOME FORUM HIGHLIGHTS

- IBM H series forecast — 1980 through 1984.
- Technology for the '80s: Trends in microprocessors, logic and memory I/O device and control, and communication terminals.
- Software trends in the 1980s.
- The Japanese view on '80s technology and the U.S. market.
- Application, development and productivity requirements for the '80s.
- Competitor view on large scale systems for the '80s: Amdahl, Honeywell, and Univac.
- Prospects for the evolution of large scale systems in the 80s, IBM.
- Communications networks and services for the '80s.
- Industry outlook, "The EDP Demand Bubble": The Wall Street View.
- Strategic planning for Distributed Processing in the '80s.
- User views on challenges and opportunities for information systems of the '80s: Exxon, GE, General Host, Hughes Aircraft, among others, including some initial experiences with IBM's 4300 by three major users.
- Office Automation: Current experiences and future direction. Panel discussion.

Cost for the three-day FORUM II is $650. Fee includes FORUM II materials reproductions of speakers' visual aids, breakfast, lunch, refreshments, and cocktails. Hotel accommodations are not included.

FORUM II will be held at the new Registry Resort in Scottsdale, Arizona, just outside of Phoenix. Although intensive work sessions are planned, attendees will enjoy the relaxed atmosphere and fine accommodations of the Registry Resort.

A block of rooms has been set aside at attractive rates for FORUM II participants. Please indicate on the registration form whether you want to receive a postage-paid reservation card; or you can call the Registry Resort directly, at (602) 991-3800, and mention FORUM II.

Return the registration form today, or call (602) 258-3222 Sue Croft ACT Corporation

Please reserve____space(s) @ $650 per attendee at the three-day FUTURE SYSTEMS FORUM II. I am including on a separate sheet of paper the names of those (besides myself) who will attend.

Early registration, by February 1, entitles you to a 10% discount. Each additional attendee from the same organization is also entitled to the 10% discount.

☐ Payment enclosed (Make payable to ACT Corp)
☐ Please bill company
Total amount________________
☐ Check here to receive Reservation Conf from the Registry Resort
☐ Check here to receive more details on the program

March 3, 4, and 5 1980

Advanced Computer Techniques Corporation
222 North Central Avenue
Phoenix, Az 85004 ATTN: FORUM II

Name ________________
(Please print)
Title ________________
Company ________________
Street ________________
City ________ State ______ Zip ______

Fill in above, detach this form and mail it with your payment to ACT at the address above You will receive registration and accommodations information well in advance of FORUM II Late cancellations are subject to a $100 charge

Computervision Expects No Problems

BEDFORD, Mass. — Martin Allen, chief executive officer of Computervision Corp., recently said the resignations of two principal officers would not adversely impact the company's operations.

Allen felt compelled to make that statement, he said, after a brief announcement of the resignations brought a flurry of speculation from Wall Street observers that Computervision's management would be too thin to manage the firm's fast-paced growth. During the past five years, Computervision has tripled its sales, going from $25.2 million to $71.6 million in fiscal 1978. Allen estimated 1979 sales at $130 million.

The resignations that sparked public discussion came from Philippe Villers, a company founder, board member and senior vice-president, and Michael J. Cronin, vice-president and executive vice-president in the Productivity Systems Division. The division accounts for about 75% of the revenues of Computervision, which specializes in computer-aided design and manufacturing systems.

The two men left to form a new firm specializing in industrial robotic systems.

According to Allen, Villers had not been active for a number of years in Computervision's operating line management or in direct research, design or development of products.

With regard to the second resignation, Allen said Cronin had told him more than a year ago that he wanted to get back into a smaller, entrepreneurial environment. Expecting Cronin to leave, Allen began to restructure and reassign responsibilities within the Productivity Systems Division, creating at least seven vice-presidencies.

Trading in Computervision's stock on the New York Stock Exchange stopped briefly after speculation on the company began. However, the price of the company's stock did not fluctuate dramatically, Allen said.

OUR FAST NEW PRINTER FOR YOUR IBM 3270:

MORE OUTPUT. LESS OUTLAY.

At 150 cps, Decision Data's new 6541 serial printer is faster than all of IBM's serial printers. And it costs less.

Our higher speed means more output. Our buy/rent/lease prices and terms mean less outlay.

To repeat, the printing speed of our new 6541 serial printer is a fast 150 cps. IBM serial printer speeds are 40, 66, 80, and 120 cps.

But you don't want to print faster just to finish sooner. You want to be able to get more done in a work day.

Compare: With our printer you can do 3.75 times as much as their 40 cps units, 2.27 times as much as their 66 cps units, 1.87 times as much as their 80 cps units, and 1.25 times as much as their 120 cps units. At the least, you get two extra hours output in an eight hour day.

The less money part. You'll save. But the saving will depend on what you're replacing, and the terms.

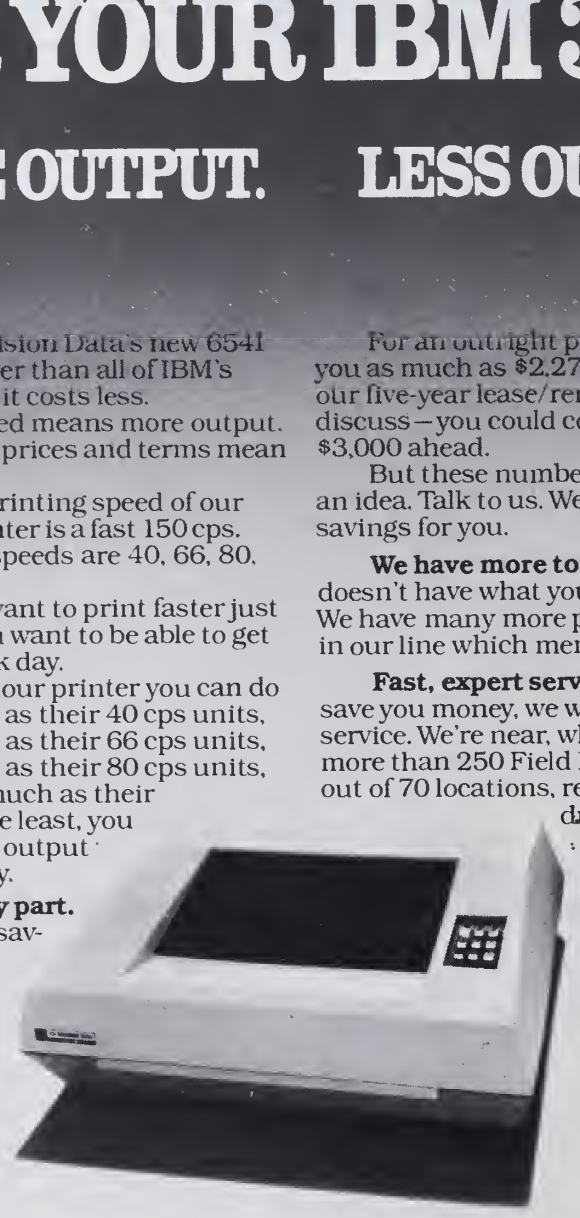
For an outright purchase, we can save you as much as $2,275 on each unit. With our five-year lease/rental — a term IBM won't discuss — you could come out more than $3,000 ahead.

But these numbers are just to give you an idea. Talk to us. We'll quote specific dollar savings for you.

We have more to offer. If our new 6541 doesn't have what you need, don't give up. We have many more printers and terminals in our line which merit your consideration.

Fast, expert service, too. While we save you money, we won't leave you without service. We're near, wherever you are. We have more than 250 Field Engineers, working out of 70 locations, ready to respond at the drop of a dot.

For more information, call 215-674-3300. Or write—
Decision Data Computer Corporation, 100 Witmer Road, Horsham, PA 19044.



DECISION DATA®
COMPUTER CORPORATION
makes computing cost less

DG Partner Changes Name

WESTBORO, Mass. — Data General Corp.'s joint venture partner in Japan has changed its name from Nippon Minicomputer Corp. to Nippon Data General Corp.

The Japanese firm plans to build a 50,000 square-foot addition to its manufacturing plant in Gyoda. The new capacity will be used to start production of DG's Eclipse S/140 systems.

The Japanese firm is now licensed to manufacture DG's complete product line. Prior to that, since 1972, the firm manufactured only DG's Nova systems.

Coincidental with the name change, DG appointed J. Thomas West engineering manager for the firm's Japanese Business Development Group. West will manage high-technology and product development programs undertaken jointly by the two firms.

Since 1972, Nippon Data General has shipped 5,000 DG systems, primarily to domestic customers.

Executive Corner

- Gerald B. Bay has been named president and chief executive officer of Dialog Systems, Inc.
- Allen Bennett has been promoted to the newly created position of national/strategic manufacturing specialist at Northrop Data Systems, Inc.
- John W. Biddinger has been named chief administrative officer of Anacomp, Inc. This is a new position at Anacomp, encompassing the responsibilities for corporate finance and mergers and acquisitions.
- Robert E. Rawlins has retired as chairman of the board of Computer Automation, Inc., a post he held for 11 years.
- John Bodell has been named vice-president of sales for Beehive International.
- Barry G. Hull has been appointed corporate vice-president of international operations at Storage Technology Corp.
- P. Desmond Crain has been named vice-president of Software International's new Western Division. Crain most recently worked for Itel Corp.
- Phil R. Cobb has been named vice-president and general manager of Harris Corp.'s Government Communications Systems Division.
- Larry Baum has been named vice-president for quality assurance at Pertec Computer Corp.'s Peripherals Division.
- Bruce M. (Rusty) Smith has been promoted to vice-president of marketing at Leardata.
- Scott Holt has been appointed vice-president of marketing at Century Data Systems. Holt joins Century Data from Control Data Corp., where he was Western regional manager for miniperipherals.
- Dearborn Computer Co. has promoted Harrison M. Kelso III to president. He most recently served as vice-president of marketing. In another move, Ira E. Levy was promoted to executive vice-president from the position of vice-president of finance and treasurer.

Six-Month Revenues Up By 27% at National Semi

SANTA CLARA, Calif. — National Semiconductor Corp. reported an increase of 23% in revenues and 36% in earnings for its second quarter.

National Semi's revenues totaled $207 million and earnings were $11 million or 81 cents per share in the quarter. In the comparable period in its last fiscal year, the firm's revenues totaled $168.8 million and earnings were just over $8 million or 61 cents per share.

For the first half of fiscal 1980, National Semi reported revenues of $449 million, 27% ahead of last year's six-month revenues of $353 million. Earnings of $23.6 million or $1.73 per share exceeded by 40% the earnings of $16.8 million or $1.26 per share in the year-ago period.

Commenting on the company's performance, Charles E. Sporck, president and chief executive officer, said "We have been pleased with the performance this year of our semiconductor components, point-of-sale and consumer products businesses."

Revenues and earnings derived from IBM plug-compatible systems sold by the firm's Advanced Systems section will not impact the company until the third quarter, Sporck noted. Itel Corp. transferred this portion of its business to National Semi last October.

Sporck also said the firm made substantial investments in production facilities and research and development during the quarter.

STSC Shows 19% Sales Rise

BETHESDA, Md. — STSC, Inc. (formerly Scientific Time-Sharing Corp.) posted an increase of 19% in revenues and 21% in earnings for its second quarter.

Revenues for the quarter reached $4.6 million and earnings totaled $257,000 or 15 cents per share. In the year-ago period, STSC posted revenues of $3.9 million and earnings of $212 million or 14 cents per share.

For its first half, STSC's revenues climbed to $9.2 million, up from the $7.6 million reported for the first half of fiscal 1979. Earnings for the half hit $593,000 or 35 cents per share, a 39% increase from the $425,000 or 28 cents per share in the same period last year.

The firm recently completed two cash acquisitions, the first in its 10-year history. For $650,000 STSC acquired the assets of Applied Computer Science Research Corp., a firm specializing in software based on APL. STSC now concentrates in services and program products based on this language.

"APL is primarily used on large-scale computers . . . but our objective is to make APL the best language for all computer applications necessary to run a business," STSC President Daniel Dyer said.

In the second move, the firm acquired for $100,000 all the common stock of Resource Systems, Inc. of Denver, a firm specializing in on-line accounting services for oil and gas exploration companies.

Group Set for Users Of DP Graphics

WASHINGTON, D.C. — Computer graphics users will be represented by a new, independent industry association formed to address industry-related problems, provide educational resources and promote user/supplier communications.

The National Computer Graphics Association (NCGA) will hold its first annual conference June 16-18 at the Sheraton-National Hotel here. The program will include tutorials, technical presentations and vendor exhibits.

More information is available from the NCGA at Suite 512, at 1129 20 St. N.W., Washington, D.C. 20036.

Nickels & Dimes

Electronic Memories & Magnetics Corp. has sold its subsidiary, EMM Semi, Inc., to GTE Sylvania, Inc. The sale price exceeded $20 million in cash, $6 million of which was paid at the time of the sale. The remainder is payable in early 1980.

$$$

CGA Computer Associates, Inc., a consulting and software firm, declared a 100% stock dividend payable Feb. 1 to shareholders of record Jan. 25.

$$$

Computer Automation, Inc. has signed a new agreement with its bank for a staggered credit line extending over the next 18 months. The agreement calls for an unsecured credit line starting at $15 million and declining to $12 million by May 31, 1981. The agreement, which requires compensating balances as well as certain balance sheet and profit requirements, succeeds an interim agreement signed last August.

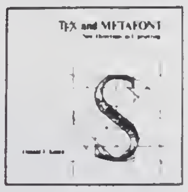
$$$

United Computing Systems, a subsidiary of United Telecommunications, Inc., has acquired the Utility Data Services Division of Itel Corp.

$$$

Compuserve, Inc. has agreed to be acquired by a subsidiary of H&R Block, Inc. The proposed merger would convert each Compuserve share to either $20 cash or .8 share of H&R Block common. The purchase price would be about $23 million.

TEX and METAFONT, New Directions in Typesetting
by Donald E. Knuth

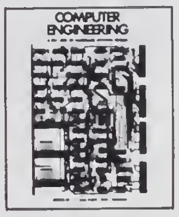


TEX and METAFONT, New Directions in Typesetting describes two systems that are going to change the typesetting/publications world. TEX is a system for typesetting technical text currently being implemented in PASCAL. It is in the public domain and is available to all who are involved in computerized typesetting. METAFONT, a system for design of alphabets suited to implementation on raster-based devices, permits a designer to give a completely precise definition to an infinite variety of typefaces. TEX and METAFONT are unique and powerful achievements whose concepts will be useful to: authors and publishers; programmers and system designers in typesetting, graphics, and office automation; typeface designers and commercial artists; compositors; university computing centers; and manufacturers of typesetting equipment. Foreword by Gordon Bell. A co-publication of Digital Press and the American Mathematical Society. 1979, 360 pp., ISBN 0-932376-02-9, paperback, $12*.

Data Processing Technology and Economics, Second Edition
by Montgomery Phister, Jr.

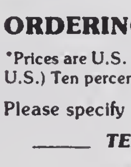
Data Processing Technology and Economics, Second Edition, is a comprehensive study of the data processing industry from its inception through 1978-79. It provides quantitative data and insightful narrative on four topic areas: the marketplace, products, applications, and costs. Coverage includes operating costs (to the user) and development, manufacturing, marketing, and maintenance costs (to the supplier). Other topics include hardware and software reliability, computer (and peripheral) population, system performance with multiprogramming, software performance and usage, I/O technologies and costs, computer use by industry and government, principal applications, human performance factors, and the important computers. ***Data Processing Technology and Economics*** is for users, applications programmers and systems analysts, system programmers, hardware designers, and managers. A co-publication of Digital Press and the Santa Monica Publishing Company. 1979; 736 pp.; hardbound (ISBN 0-932376-03-7), $29.95*; paperback (ISBN 0-932376-02-9), $24.95*.

Computer Engineering: A DEC View of Hardware Systems Design
by C. Gordon Bell, J. Craig Mudge, and John E. McNamara



Computer Engineering: A DEC View of Hardware Systems Design is the story of hardware systems design practiced at Digital Equipment Corporation from 1957-77. It provides a set of case studies of classic design principles and techniques practiced under the real-world constraints of marketplace economics and continually evolving technology; an overview of the computer industry—insight into the complexities of its interrelated forces and an historical perspective; and a description of the development of families of machines. ***Computer Engineering*** is for people who want to understand the evolution of hardware systems design: hardware systems designers, university students (used in computer architecture courses at Caltech and UC/Berkeley); management of companies planning systems or planning to buy systems; software engineers; users. 1978, 585 pp., ISBN 0-932376-00-2, hardbound, $19.95*.

Technical Aspects of Data Communication
by John E. McNamara



Technical Aspects of Data Communication provides a practical approach to the nuts-and-bolts problems and solutions in configuring communications systems. It describes common pitfalls in systems design and ways to avoid them, while also serving as a useful reference tool. ***Technical Aspects of Data Communication*** is intended to fit between books that treat data communication solely on a system level and hardware manuals that specify in detail the function of each bit in each register. The book features: comparison of protocols (DDCMP, BISYNC, SDLC), extensive explanation of interface standards (CCITT/V.44, RS232C, RS422, RS423) comprehensive appendices (how far—how fast?, modem options, codes (Baudot, ASCII, and others), UART, format and speed table for asynchronous communication, channel conditioning). Other topics covered are the 20-milliampere loop, telephone switching systems, error detection, and digital transmission and packet switching networks. 1977, 382 pp., ISBN 0-932376-01-0, hardbound, $19.95*.

digital
Digital Press, Educational Services
Digital Equipment Corporation
12-A Esquire Rd., Billerica, MA 01862

ORDERING INFORMATION

*Prices are U.S. only. (Contact your nearest office of Digital Equipment Corporation, Educational Services for prices outside U.S.) Ten percent discount for two or more copies. Shipping and handling charges will be added to all orders not prepaid.

Please specify number of copies:

_____ ***TEX and METAFONT, New Directions in Typesetting***
_____ ***Data Processing Technology and Economics,*** Second Edition
☐ hardbound ☐ paperback
_____ ***Computer Engineering: A DEC View of Hardware Systems Design***
_____ ***Technical Aspects of Data Communication***

☐ Check enclosed.
☐ Please invoice me. (Specify billing address if different from shipping address.)

Remit to: Dept.DPD, Digital Press, at the address above.

Vendors Leaving Valley for Cheaper Pastures

(Continued from Page 79)

Aquadilla, Puerto Rico, slated to produce data terminals for its Computer Group.

In addition, HP contributed more than $330,000 to finance low-cost housing and transportation projects in Palo Alto as required by local law of firms that build corporate structures in the area.

Shugart to Sacramento

Another firm expanding away from the valley is Shugart Associates, which purchased acreage in Sacramento for its first major manufacturing plant outside the region.

The first phase of Shugart's expansion calls for a 160,000 square-foot plant to begin operations in September and employ nearly 2,000 people. A second facility of equal size is planned for the same lot.

"We saved $1 million by building outside Santa Clara County," maintained R.D. Riggs, director of facilities. Northern California carries land costs among the highest, he noted, at $4.50 to $5.50 per square foot. This compares to costs of $3 to $4 in the Sacramento area and $1 to $1.50 in Spokane, Wash.

By setting up satellite facilities outside the valley, Shugart hopes to find less competition for labor and a better highway system so employees can enjoy a shorter commute and less traffic congestion. In the valley, "commuting was becoming a big problem," Riggs observed, adding that "with costs rising as fast as they are, it was difficult for the hourly wage earner to afford a car and gasoline which averages $1.12 a gallon for unleaded regular."

Ramtek Strategy

Not only can't hourly wage earners afford the Silicon Valley life, but neither can many salaried workers. Last year, Ramtek Corp. hired four employees — a regional manager, two branch salesmen and a junior engineer — from other states and none could make it financially, according to President Charles McEwan. In fact, "we had to send the junior engineer to our European operations."

Ramtek no longer tries to recruit from the Midwest or even the East, but instead seeks new employees who live in the area, primarily individuals who are single, have no children, can be apartment dwellers or "who are independently wealthy," McEwan quipped.

Unlike larger valley companies that can afford to lure new personnel by paying differences in mortgage rates or paying closing costs, Ramtek holds open houses on Saturdays to compete for new hires.

The high cost of living in Silicon Valley combined with shortages of programmers and software engineers put Ramtek and other local firms "in the position of having to sell the company to prospective employees instead of the other way around," McEwan said.

Rent Jumps

For Ramtek itself, monthly land rental costs have jumped 60% in three years from 25 cents per square foot to 40 cents today. Ramtak leases an 85,000 square-foot facility in Sunnyvale and holds an option on an adjoining seven acres of land.

This property changed hands three years ago for $50,000 an acre, McEwan said, noting it is currently worth $175,000 an acre.

CBN Editor Dead at 46

(Continued from Page 79)

assistant and sports writer for the *New York Daily News, New York Herald Tribune* and *New York Enquirer*. In 1958 he became a general assignment reporter for the *Evening News* of Perth Amboy, N.J. then moved over in the same capacity to the *Elizabeth Daily Journal* in Elizabeth, N.J., the following year.

In 1962, Drohan began to specialize in the computer and electronics industries. He moved up rapidly in *Fairchild's Electronic News* organization, serving as a reporter, copy desk editor, assistant news editor, financial writer and feature editor before leaving in 1970 to join McGraw-Hill. After a brief period with that company's Electronics Management Advisory Service, he joined Cahners Publications.

Drohan remained in New York for his first three years with Cahners, fulfilling his duties as associate editor and managing editor of that company's *Electronic Purchasing* magazine. He moved to Boston with the magazine in 1974 and was named chief editor the following year. He was responsible for establishing that publication in its present form as *Electronic Business* magazine.

Drohan also worked on another Cahners publication, *Plastics World* magazine, before joinging CBN and returning to New York.

He was the recipient of a number of journalism awards, including the Certificate of Merit from the National Hemophilia Foundation in 1959, the Best Story of the Year Award from Fairchild Publications in 1965 and two Jesse Neal Awards — the highest awards available in the business press — from the American Business Press in 1974 and 1975.

Accurate Conversion

RPG to COBOL

When you make the change to the common language compatibility of COBOL, you'll want to translate with speed and accuracy. DASD translators accept most RPG and produce ANS COBOL quickly and usually error free, with significant savings in time and money. The COBOL generated is easily understood and maintained.

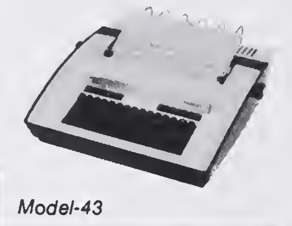
In addition, we offer you a variety of service options, ranging from use or lease arrangements to a complete DASD turnkey conversion package.

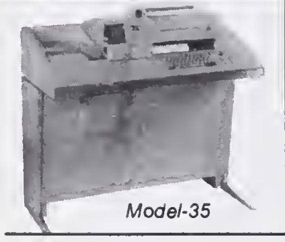
DASD®

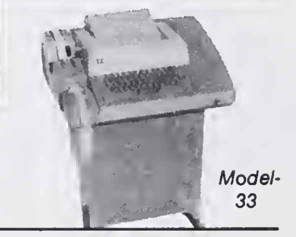
Low-cost Test Evaluation. Send or call for our free literature/kit.
DASD Corporation • Corporate Services Center
Dept. CWM11 • 9045 North Deerwood Drive
Milwaukee, Wisconsin 53223 • (414) 355-3405

TELETYPES®

Station Controllers-Modems-Data Sets







Models 28, 32, 33, 35, 40, 4210 and 43

- 81D1, 83B3, 4VH, FINAC
- 8A1, 8B1, 85A1, 85A2, 86A1, 86A2, 86B1, 86B2
- Dataphone, Telex, TWX and TWX/DDD

FEDERAL Communications Corporation
11126 Shady Trail, Dallas, Texas 75229 U.S.A.
(214) 620-0644 TELEX 732211

TONE 3

IS HIGH PERFORMANCE—LOW OVERHEAD

TSO for VS1

CHECK THESE FEATURES

- Edit with full screen capability
- Internal reader job submit
- Output retrieval with RES support
- System maintenance
- Program development
- Data entry
- System debugging
- Text editing
- Performance monitoring
- User command interface
- Interactive program execution
- Operations console support
- Dataset maintenance
- Catalog management
- Standard IBM TSO commands
- Enhanced 3270 useability
- Full ASCII terminal support
- No user swapping
- No TCAM
- No VS/2 overhead

TONE Software Corp.

Write for Details

1124 N. GILBERT
ANAHEIM, CA 92801
(714) 991-9460

Discover why hundreds of PDP-11 users have turned to us for Pascal.™

They're in process control. In data base management. In education, research and communications. Running on LSI-11's, PDP-11/70's and everything in between. RSTS/E, RT11, RSX or IAS — it makes no difference, they praise our Pascal.

Because they all have one thing in common. A desire to get more from their PDP-11 than another language — or another Pascal — can provide.

We've captured the elegance of Pascal in a real world compiler. It converses directly in machine language, giving remarkable execution speed and efficient memory use. It features straight-forward program structure, uncluttered syntax, and other advantages of full standard Pascal.

But there's more, in the form of real-time extensions. 15 digit (double precision) arithmetic. In-line assembly code. I/O hardware access. FORTRAN interface. Direct-access files. Overlays. Plus others. There's even an interactive symbolic debugger.

Reliability? Introduced in 1975, we're at over 400 sites now. We guarantee stated performance and provide 1 year of follow-up support. Give us a call; we have a demo library, manuals, and benchmark, ready for your inspection.

Oregon minicomputer Software inc.

2340 SW Canyon Road
Portland, Oregon 97201
(503) 226-7760
TWX 910-464-4779

Distributors:
Australia: Sydney; Network Computer Services, 290 3677
Canada: Vancouver; Valley Software, (604) 524-9741
England: Stafford; Hourds Computing Ltd. 0785 44221
Japan: Tokyo; Rikei Corporation, 03-345-1411

PDP-11, LSI-11, PDP-11/70, RSTS/E, RT11, RSX, and IAS are trademarks of Digital Equipment Corporation

Sharpen your EDP management skills with these economical reports from AUERBACH.

Now you can get high-quality EDP management information from AUERBACH at a special low price!

These 67 "how-to" reports, priced at only $10 each, will help you battle rising DP costs, increase operations efficiency, and sharpen your management skills.

To order, just check the box next to the appropriate report(s), clip this ad, and mail it today.

GENERAL DP MANAGEMENT

☐ Another Look at the DP Manager (1-06-02)
☐ Setting Application Priorities (3-10-02)
☐ The Management of Continuing Change (1-06-09)

CONTROLLING COSTS

☐ 54 Ways to Reduce DP Costs (2-02-05)
☐ Approaching Cost-Benefit Analysis (1-01-05)
☐ Achieving Cost-Effectiveness in EDP (41-01-05)
☐ Reducing International Communications Costs (52-10-04)

WORKING WITH USERS

☐ Improving Relations with User Departments (2-01-04)
☐ Conducting User Training (36-04-02)
☐ User Participation in Systems Development (32-02-03)
☐ Developing User Schedules (43-01-02)

PERSONNEL

☐ DP Personnel Evaluation and Testing (2-01-01)
☐ Job Descriptions (2-01-08)
☐ Flexitime for DP Personnel (2-01-11)
☐ Human Resources Matrixing (2-01-09)
Developing and Administering the Training Program (3 portfolios, $10 each)
☐ Part I: Cost/Benefit Justification; Training Needs (41-02-10)
☐ Part II: Responsibilities of the Training Administrator (41-02-11)
☐ Part III: Selecting and Contracting for a Training Program (41-02-12)
Successful Interviews (2 portfolios, $10 each)
☐ Part I: Techniques (11-02-01)
☐ Part II: Employment and Counseling Interviews (11-02-02)
☐ Controlling Turnover Among Programmers and Systems Analysts (11-01-06)

HARDWARE AND SOFTWARE SELECTION AND EVALUATION

Evaluating Software Packages (2 portfolios, $10 each)
☐ Part I: Internal Strengths (33-04-02)
☐ Part II: Operational Characteristics (33-04-03)
☐ Selecting a Small Business Computer (2-04-02)
☐ Checklist for Evaluating Minicomputer Vendor Policies (2-04-11)
☐ Administering and Controlling Mixed Vendors (46-01-04)

SYSTEMS DEVELOPMENT

Estimating Time, Cost and Resource Requirements (2 portfolios, $10 each)
☐ Part I: Programming (34-01-06)
☐ Part II: Systems Analysis (34-01-05)
☐ Conducting the Feasibility Study (32-03-02)
☐ Coping with Design Changes (36-01-02)
☐ Replacement Systems Planning (1-04-08)
☐ Systems Specification Checklist (33-01-03)
☐ Systems Design Checklist (35-01-03)
☐ An Overview of Project Management--Project Organization and Control (34-01-01)

SECURITY

☐ How to Develop a Contingency Plan (41-01-09)
☐ A Checklist for Security and Contingency Planning (1-03-02)
☐ Cryptography as a Control Feature (1-03-06)

DISTRIBUTED PROCESSING

☐ Managing Distributed Data Processing (1-04-09)
☐ Problems in Decentralized Computing (63-01-01)
☐ Designing the User System in a DDP Environment (63-01-03)
☐ Developing a Corporate Strategy for Distributed Processing (50-01-08)

OPERATIONS

☐ The Data Center Manager Comes of Age (41-01-11)
☐ Operations Project Planning (44-01-07)
☐ Justifying the DP Operations Budget (44-01-01)
☐ How to Minimize Reruns (42-01-05)
☐ How to Measure Productivity (44-01-04)

PROGRAMMING

☐ Estimating Programming Time (12-02-03)
Perspectives on Software Engineering (2 portfolios, $10 each)
☐ Part I: Management Techniques (11-04-05)
☐ Part II: Programmer/Analyst Techniques (11-04-06)
☐ Automated Program Testing Tools (13-02-02)
☐ Contracting for Programming Services (11-01-09)

DATACOMM

☐ Designing an Efficient On-Line System (3-10-04)
☐ A Comparison of Network Architectures--ARPANET and SNA (51-10-13)
☐ Transborder Data Flow (50-30-11)
☐ Internal Datacomm Controls (51-20-04)

EDP AUDITING

☐ Auditing in an On-Line Environment (73-03-03)
☐ Review Points in Systems Development Life Cycle (72-01-05)
☐ How to Interview an EDP Auditor Candidate (71-03-07)
☐ Selecting Audit Software (73-01-04)

☐ Please enter my order for ____________ reports @ $10 each (plus applicable sales tax)
☐ Enclosed is my check for $ ____________
☐ Bill my company (minimum order of 3 portfolios)
P.O.# ____________
☐ Charge my credit card:
☐ VISA ☐ American Express ☐ Master Charge
Card Number ____________
Valid From ____________ To ____________

☐ Please send me more information about the AUERBACH Information Management Series.

Name/Title ____________
Company ____________
Address ____________
City ____________ State ____________ Zip ____________
Phone ( ) ____________

Signature ____________

The DP Answer Company
AUERBACH

AUERBACH Publishers Inc.
6560 North Park Drive, Pennsauken, NJ 08109
(609) 662-2070

CW/213

position announcements

FPL

FLORIDA POWER & LIGHT COMPANY

EDP AUDITOR
MIAMI, FLORIDA

We seek an experienced EDP auditor for our corporate Internal Auditing Department. You should have at least three years experience in auditing and data processing. A degree in computer science is preferred. The position requires understanding of audit and data processing philosophies and knowledge of hardware, software, data base, teleprocessing, security, cobol, fortran, assembler and systems design techniques. You will use professional oral and written communications skills to:

- Independently analyze and appraise all data processing operations.
- Assist in establishing and implementing controls, audit trails, and audit techniques in EDP applications being developed.
- Provide advanced technical assistance to other audit staffs
- Prepare and coordinate audit retrieval programs for audit use.

We offer a progressive auditing environment, a good salary and an excellent benefit package. Submit your résumé and salary requirements to:

R. B. Leonardi, Chief Auditor
Florida Power & Light Co.
P.O. Box 529100
Miami, Florida 33152

An Equal Opportunity Employer M/F

CSC

PROGRAMMER/ANALYSTS:

Here's a program that encourages you to make the most of your HP experience:

☐ It's a hands-on environment ☐ It's a turnkey system ☐ It's starting from scratch ☐ It includes a company-sponsored school in the system software

Here are the facts. The turnkey group within the CSC Systems Division is about to start building a distributed network of 35 HP mini's. Thirty-two of them will be HP 1000M's (memory resident systems); three of the nodes will be disk based systems using HP 1000E's (formerly called the 21MX).

We'll be using IMAGE/QUERY (the HP data base management system), DS/1000 (the HP distributed system software), the RTE-IV operating system, and the RTE-M operating system.

We'll also be setting up a formal training course with HP to train our staff in the internals.

Among the particularly challenging aspects of the system will be the problem of data base synchronization across the network, since it will be distributed over three of the nodes.

If you have between two and ten years experience, including some meaningful HP work, please contact us immediately as this staffing is going on NOW.

For a prompt response call (703) 533-8877 or (800) 336-3765, Ext. 137, toll free. Or, mail your resume in full confidence to The Director of Professional Staffing, MC-218 (EQ).

WE AGGRESSIVELY SUPPORT EQUAL OPPORTUNITY AND AFFIRMATIVE ACTION

COMPUTER SCIENCES CORPORATION
SYSTEMS DIVISION
6565 Arlington Boulevard Falls Church, VA 22046
Major Offices and Facilities Throughout the World.

The Faculty of Administrative Sciences announces positions for the following computer personnel:

2 PROGRAMERS
2 ANALYSTS
2 KEY PUNCH OPERATORS

Candidates must be fluent in Arabic and must be familiar with IBM system terminals.

Applicants are requested to submit their application along with copies of their academic degrees, transcripts and service experience certificates as soon as possible to:

Mr. Anas Othman
Riyadh University Office
C/O Saudi Arabian Educational Mission
2221 West Loop South
Houston, Texas 77027

Selected candidates will be informed of results accordingly.

PROGRAMMERS
ANALYSTS
SYSTEMS ANALYSTS

NORTHEAST, NEW ENGLAND
SOUTHEAST, MIDWEST

When making a career decision, you should have a choice of options.

Our clients — who are large and small leaders in manufacturing, high technology, leading computer/peripheral co's, insurance, banking, and consulting — seek individuals with programming, analytical and/or leadership ability.

We individualize our search to meet your career objectives and geographical preference.

Investigate professional opportunities offering a variety of challenges and environments.

Phone collect or forward your resume to ERWIN KLAGGE.

(203) 525-8103

cp computer professionals

Data Processing Placement – Executive Search
15 Lewis Street, Suite 105, Hartford, CT 06103

PROGRAMMERS
Richmond, Virginia

Private expanding organization needs programmers with experience in COBOL and property and casualty insurance processing. This is a career opportunity.

Experience in the following areas helpful:

PMS insurance processing package
ALC or RPG II
DL/1 or VSAM
CICS/VS & DMS/VS

Environment is medium-size shop using DOS/VS, CICS/VS, DMS/VS on-line programming and other software on IBM 370/145 1 MEG system with 3350 disk. Utilizing local and remote CRT terminals.

Good benefit package. Salary commensurate with experience and education. Some college preferred.

Send resume and salary history to:

Claude D. Busic
Virginia Farm Bureau
Mutual Insurance Company
P.O. Box 27552, Richmond, VA 23261
PHONE: (804) 788-1234

An Equal Opportunity Employer

DOCUMATION, FLORIDA.

WHERE THE NEW WAVE OF TECHNOLOGY MEETS THE ATLANTIC COAST.

You can find us at the innovative forefront of our industry. Employing state-of-the art technology in the design and manufacture of record-breaking data processing products and systems.

You can also find us on Florida's Atlantic coast. Surfing, sailing, fishing, playing golf and tennis.

We know true satisfaction comes from both professional and personal fulfillment. And because Documation is a young and responsive organization, we're able to offer unparalleled opportunities for individual contribution and rapid advancement.

Because we're located in Brevard County, we're able to offer a unique and affordable Florida lifestyle. Known as the high technology center of the Sunbelt, our communities combine big-city business and culture with neighborhood friendliness.

Trips to Busch Gardens, Walt Disney World, Daytona Beach or the Kennedy Space Center are all in a day's play. Of course, with 48 miles of beaches, 800 miles of riverfront and over 100 parks right there—why leave home?

Shouldn't you be where Documation is?

Company growth continues to create professional career opportunities. Immediate and projected requirements in the following areas may provide that key step in your career progression that you have been seeking. Check us out!!

We're particularly interested in persons with abilities in the following areas:

CORPORATE MIS

Programmers, Programmer Analysts, Systems Analysts, Data Base Analyst with IBM 370 experience and COBOL proficiency in one or more of the following applications: ☐ Finance, ☐ Marketing, ☐ Manufacturing, ☐ Field Support

SYSTEMS DESIGN/DEVELOPMENT

Hardware, Software and Firmware Systems Engineers with expertise in any of the following: ☐ Computer Architecture, ☐ Logic Design/Firmware, ☐ Compilers, ☐ Operating Systems, ☐ Diagnostics, ☐ Communications.

MANUFACTURING ENGINEERING

☐ Production Operations Support, ☐ Process/Methods Plans, ☐ Production Line Tooling (Hard and Soft), ☐ Production Test Equipment (Hardware or Software), ☐ Production Line ATE (Programmers).

FIELD ENGINEERING

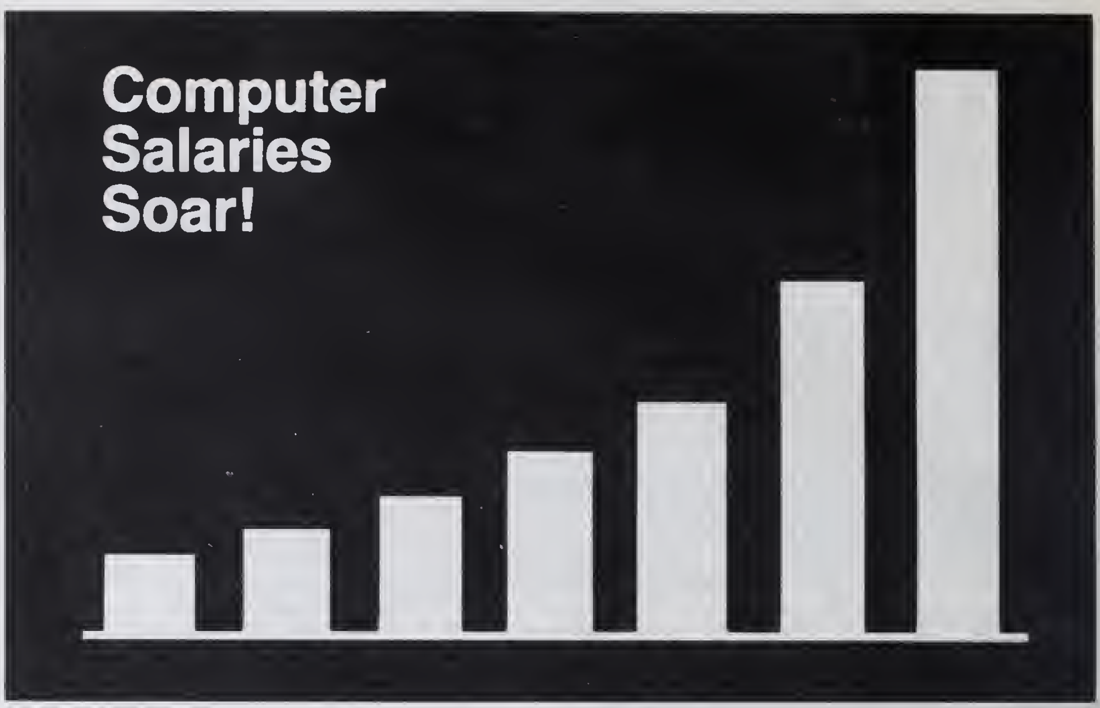
Opening exist throughout the U.S. for all levels of experience. Basic qualifications include a thorough knowledge of Analog and Digital Circuitry, Mechanical ability, A.S. in Electronics or equivalent, Good communication skills and ability in Customer Relations. Length of experience and level of ability in the following areas will determine individual placement. ☐ IBM or BURROUGHS compatible equipment, ☐ High Speed Printers, ☐ Card Readers, ☐ Card Punches, ☐ Other Peripherals.

To check us out, please submit your resume and salary history in strictest confidence to: Tom Knight, Employment Manager, Department #510.

DOCUMATION
INCORPORATED
PO Box 1240
Melbourne, Florida 32901

Documation is an Affirmative Action/Equal Opportunity Employer

23 New Categories Reported! Call for your FREE copy today.



Unprecedented demand and inflation have combined to cause salaries in the computer field to rise sharply in 1980. The new Source Edp **1980 Computer Salary Survey and Career Planning Guide** will let you know if your compensation is keeping pace with this growth...and the strategies you can use if it's not.

This comprehensive free report also provides you expert advice on a variety of important career topics such as:

- When you should consider a job change;
- How to make sure you are getting the proper exposure;
- What steps you must take to break into management;
- How you can avoid career stagnation...and much more.

The **1980 Computer Salary Survey** has been compiled by Source Edp, North America's largest recruiting firm devoted exclusively to the computer profession.

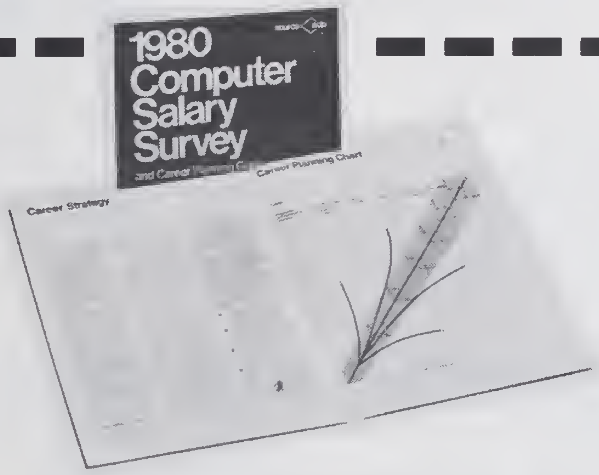
Expanded, All New Position Categories Surveyed

The **1980 Computer Salary Survey** has been expanded to provide specific data for twenty-three new categories. These include positions in data communications, mini-micro programming, data base administration, technical marketing support and EDP auditing in addition to our traditional categories of programming, software, systems design, management and computer marketing.

source edp

North America's largest recruiting firm devoted exclusively to the computer profession.
Client organizations assume our charges.

New! 1980 Computer Salary Survey



FREE Report!

For your free copy, simply phone the Source Edp office nearest you.

If unable to call, write:

Source Edp, Department CS1
721 Enterprise
Oak Brook, Illinois 60521

(When writing, please be sure to indicate home address and current position title.)

United States	
Arizona	
Phoenix	602/258-9333
California	
San Francisco	415/434-2410
Palo Alto	415/856-0600
Los Angeles	213/386-5500
Van Nuys	213/781-4800
Torrance	213/540-7500
Irvine	714/833-1730
San Diego	714/231-1900
Colorado	
Denver	303/773-3700
Englewood	303/571-4450
Connecticut	
Hartford	203/522-6590
Stratford	203/375-7240
District of Columbia	202/466-5890
Florida	
Miami	305/624-3536
Georgia	
Atlanta	404/325-8370
Illinois	
Chicago	312/782-0857
Northfield	312/446-8395
Oak Brook	312/986-0422
Rolling Meadows	312/392-0244
Indiana	
Indianapolis	317/631-2900

Louisiana	
New Orleans	504/561-6000
Maryland	
Baltimore	301/727-4050
Massachusetts	
Boston	617/482-7613
Wellesley	617/237-3120
Michigan	
Detroit	313/963-0510
Southfield	313/352-6520
Minnesota	
Minneapolis	612/544-3600
St. Paul	612/771-0544
Missouri	
St. Louis County	314/862-3800
St. Louis Downtown	314/231-4880
Kansas City	816/474-3393
New Hampshire	
Nashua	603/880-4047
New Jersey	
Cherry Hill	609/482-2600
Edison	201/494-2800
Paramus	201/845-3900
Union	201/687-8700
New York	
Midtown	212/736-7445
Wall Street Area	212/962-8000
Long Island	516/364-0900
White Plains	914/683-9300

North Carolina	
Greensboro	919/294-6550
Ohio	
Cincinnati	513/769-5080
Cleveland	216/771-2070
Oregon	
Portland	503/223-6160
Pennsylvania	
Philadelphia	215/665-1717
King of Prussia	215/265-7250
Pittsburgh	412/261-6540
Texas	
Dallas	214/387-1600
Fort Worth	817/338-9300
Houston Central	713/751-0100
Houston Suburban	713/626-8705
San Antonio	512/344-0217
Virginia	
McLean	703/790-5610
Washington	
Seattle	206/454-6400
Wisconsin	
Milwaukee	414/277-0345
Canada	
Toronto	416/364-2919
Don Mills	416/425-5730

JOIN THE TEAM THAT DATAPRO RANKED #1.

In its 1979 annual survey, Datapro ranked Itel's field service and support team #1 in customer satisfaction, reliability and technical support. Now that team is with National Advanced Systems, a subsidiary of National Semiconductor. And whether you work in the field or at our San Francisco Bay Area headquarters, the challenges and opportunities that spurred our #1 ranking are still evident.

Join our expanding and successful team. Look into these immediate career opportunities.

Systems Support Representatives

We need self-motivated individuals to consult and provide technical support to field sales and marketing. Candidates must be able to write and present technical materials and be knowledgeable of the internals of IBM virtual operating systems (MVS, SVS, VSI, VM, or DOS/VS). College degree or equivalent experience plus background in FORTRAN, COBOL or PL/1 and a high level of proficiency in ALC required.

Field Engineers

If you have the skills and ability to excel in field engineering, you'll be recognized for it at National Advanced Systems. We have field engineering openings nationwide, which require an AA degree in electronics or equivalent military experience. Our more advanced positions require experience on IBM 370/158 or larger CPUs or associated peripherals experience.

Programmer/ Analysts

We need Programmer/Analysts with COBOL experience to participate in the development of marketing, financial and inventory control systems. If you have 3-6 years of COBOL programming experience, look into these immediate openings at our Palo Alto headquarters.

Systems Engineer, Telecommunications

We need an expert in telecommunications planning to establish our comprehensive communications system. If you have 3-6 years' experience in dealing with the installation and planning of communications facilities and have extensive background in communications protocol for computer systems, consider this opening at our Palo Alto facility.

Field Support Representatives

We need talented, creative people with a dynamic approach to problem solving to resolve problems in customer systems software, provide an interface between the support organization and IBM, assist field engineering with problem determination, and assist Systems Support Representatives in running benchmarks. Candidates must be experienced in problem solving with systems control programming and have at least 5+ years' experience in systems programming.

National Advanced Systems provides computer professionals with a small company environment which encourages individual accomplishments, plus the backing and benefits of a large semiconductor leader.

For consideration, please send a complete resume to National Advanced Systems, Personnel Department, 3145 Porter Drive, Palo Alto, CA 94304. An Equal Opportunity Employer M/F/H.

National Advanced Systems

Systems Programming Supervisor

San Francisco
Bay Area

The successful candidate will have:

- An exceptional technical background including experience with multi-processors operating under MVS.
- The ability to manage an outstanding technical staff in a State-of-the-Art environment.
- Excellent written and oral communication skills.
- Potential or interest in management opportunities beyond this position.

We are consultants to management. Please call or send resume, in confidence, to Sam Hoover, Professionals for Computing, Inc., One Maritime Plaza, Suite 1350, San Francisco, CA 94111. (415) 956-7120. Employer assumes fee.

professionals for computing, Inc.

Vacancy Computer Science

Two Assistant Professorships are available beginning September 1, 1980, (or June if desired). These are tenure track positions. Competitive salary. Excellent fringes. Send resume' to **Dr. R.G. Vinson, Dept. of Mathematics, Statistics, & Computer Science. Univ. of South Alabama, Mobile, AL 36688.** USA is an Equal Opportunity Employer.

EDUCATION SPECIALIST - NH

Major computer vendor requires detail-oriented indiv. to design, develop & teach in-house EDP seminars. IBM or DEC bkgrd. pref. Hi-visibility with heavy tech & user interface. Salary $22,000. (Fee Paid). Contact Gerry Battista.

Robert Half of Boston
Agency
100 Summer Street
Boston, MA 02110
(617) 423-1200

HOTEL SYSTEMS DEVELOPMENT

Holiday Inns, Inc., #1 in the hotel industry, is continuing its aggressive out-front development, expansion and growth. We are currently seeking Data Processing professionals to participate in the design and development of our automated hotel systems. Efforts will focus on front desk systems, back office accounting and administrative systems and their integration with our Holidex II℠ reservation system, the world's largest and most advanced.

PROGRAMMER ANALYST

4-6 years of system design and programming experience on minicomputer systems is required to participate in this exciting ground floor development effort. Experience with hotel computer systems and the Texas Instrument 990 Series is desirable.

For the opportunity to grow in a dynamic, changing and competitive industry, send resume with salary history to:

HOLIDAY INNS, INC.
C.W. Hanna
Hotel Group Personnel
3796 Lamar Ave., 3rd Floor
Memphis, TN 38195

Equal Opportunity Employer m/f/h

TOLL FREE
800/633-6644
In Alabama Call Collect
(205) 833-3467
24 Hr. Telephone Service

SUNBELT SERVICE

S/3 MOD 10
S/3 MOD 12
S/3 MOD 15
SYSTEM/32
SYSTEM/34

We are currently recruiting for a number of openings in System/3, System/32 and System/34 shops throughout the South. Starting salaries range from $15,000 to $30,000. All fees paid. No contract required. Call toll free or mail resume for fast, confidential service.

Ole Olson — Rick White

GENERAL PERSONNEL CORPORATION
213 Gadsden Highway
Birmingham, AL 35235

CHARGE INTO THE 80's

This New Year brings new budgets and brand new openings at all levels. Special needs exist in the following categories:

SYSTEMS MANAGER	PDP 11, RSTS
SYSTEMS PROGRAMMERS	IBM OS/VS, CICS
PROGRAMMER ANALYST	IBM 370, COBOL
PROGRAMMER ANALYST	PDP 11, BASIC +

Openings are available throughout New England and nationwide through our affiliation with National Personnel Consultants.

Naturally, companies pay all fees, interview and relocation expenses.

Send resume or call (collect) A.J. Rachele at (413) 781-0982.

npc
NATIONAL PERSONNEL CONSULTANTS INC

dpS PECIALISTS
DYNAMIC PERSONNEL SYSTEM
181 Park Avenue
West Springfield, MA 01089

CSC

SYSTEMS PROFESSIONALS

The Navy Asked For It... CSC Created It...

Join The Winning Team Responsible For The

NAVAL WARFARE GAMING SYSTEM

MOORESTOWN, NJ

CSC, the world's largest independent software company, adds another to its long list of major accomplishments with the design of the NWGS for the U.S. Navy.

NWGS is a computer assisted Warfare Gaming System that provides a decision-making environment for our Navy's Fleet Officers. The system will be implemented and tested at MOORESTOWN, NJ and installed and maintained at the Naval War College at Newport, RI.

The winning CSC, Defense Systems Division plan design features a Honeywell Level 68 MULTICS Central Computer. User interface is provided via Sanders Graphics 7 interactive consoles and alphanumeric displays. The s/w design allows the user to play games at any command level, with the System supplying subordinate Functions and Simulation of Platforms, Weapons, and Sensors. The s/w is being developed in the MULTICS System Language, PL/1.

The System, which offers enchanced automated capabilities at all stages of gaming, includes both Student and Command Gaming. The latter will be used chiefly to support the Gaming requirements of officers from the Operational Fleet and Naval Commands.

The CSC, Defense Systems Division is deeply involved in analyzing the requirements, designing the System, developing the specifications, and performing the Systems planning for NWGS to insure a low risk, high reliability System. This has created immediate opportunities for systems professionals skilled in the following areas:

- **Software Development**
- **DOD Oriented Systems Test/ Development of Test Specifications & Procedures**
- **Computer Operations Management**
- **Systems Engineering—Functional Specification Interface Definition**
- **Equipment Systems Engineering**
- **Site Installation Design Engineering**
- **R-T Systems Programming**
- **Math Modeling**
- **Configuration Management**
- **Quality Assurance**
- **Human Engineering**
- **Test Definition**
- **MIL-STDs for RMA**
- **Maintainability Test Development**
- **Test Design Engineering**
- **Training**
- **Logistics Specialists**

Look into the numerous advantages of a career with CSC, Defense Systems Division: high visibility backed up by our NEW and comprehensive Career Planning Program, excellent salaries commensurate with your experience, full company benefits, and opportunities to develop your expertise to its fullest potential in a technically sophisticated state-of-the-art environment.

For immediate consideration, call or send your resume in strictest confidence to:

Anne M. Lynch
Manager of Professional Staffing

TOLL FREE: 1-800-257-7762 COLLECT: (609) 234-1100

COMPUTER
SCIENCES
CORPORATION

DEFENSE SYSTEMS DIVISION
P.O. Box N, Moorestown, NJ 08057

Major Offices And Facilities Throughout The World
An Equal Opportunity Employer M/F

EDP SYSTEMS ANALYSTS, PROGRAMMERS

Aramco needs you now to run our sophisticated teleprocessing network as it grows from 800 to 1500 terminals.

Aramco is the world's largest oil-producing company and the key firm involved in the development of Saudi Arabia's energy resources.

Some of our projects are the world's most sophisticated. They are staggering in scope, complexity and imagination. Nowhere else is such advanced technology being applied so widely.

Our advanced computer network is the absolute intelligence center for all of Aramco's many activities. Everything depends on it: exploration, production, refining, materials supply, engineering, finance, personnel, process control, and more.

Here are the highlights of the system: Two IBM 3033's, one 370/158, one 370/168. Smaller systems include a MVS/SE, JES2, TSO, IMS/VS and VTAM.

Aramco's regional teleprocessing network, running under IMS and TSO, will be growing from 800 terminals to 1,500 terminals next year.

That's why we need good EDP people like you.

The immediate openings

- *Analyst/Programmers.* We need you if you have experience in engineering, finance, power systems, inventory control, purchasing, payroll, industrial relations. Requirements: a BS or a BA in physical science, computer science, engineering, math, finance or business administration. You should also have at least 3 years' experience, preferably in one or more of these languages: PL/1, IMS-DB/DC, ADF, MARK IV, COBOL, FORTRAN.
- *Systems Programmers.* Our Computer Science Division needs you to work on IBM 3033's, running MVS/SE, JES2 and VTAM. Requirements: a BS or a BA in physical science, computer science, engineering, math, finance or business administration. You should also have at least 2 years' experience in one or more of these areas: MVS, JES2, VTAM.

Excellent combination of benefits offered

As an EDP Specialist with Aramco, you can earn a competitive salary, plus a cost-of-living differential. In addition, you get a tax-protected premium for overseas employment which can amount to as much as 40 percent of your base salary.

Beyond that, Aramco offers you a comprehensive benefits package which includes 40 days' paid vacation every 12½ months (this gives you the opportunity to travel in Europe, Asia, Africa)—plus housing for singles and families, and American school systems for your children.

Interested? Send your résumé in confidence to: Aramco Services Company, Department CW010780JWCA, 1100 Milam Building, Houston, Texas 77002.

CHALLENGE BY CHOICE

ARAMCO

SERVICES COMPANY

Happy Landings!

Land an absolutely, positively great job with Federal Express

Coast down the runway to success with the exciting career opportunities available with Federal Express. Federal Express took the idea of reliable overnight transport of high priority packages and turned it into a solid business with an unparalleled reputation. Constant innovation, increasing reliability and a determination to be the best is all part of the Federal Express story. Our unprecedented success has created opportunities in the following areas of our Systems and Programming Department.

PROGRAMMER ANALYST

- **Billings**
- **Flight Operations**
- **General Ledger**
- **Inventory Control**
- **Maintenance & Engineering**
- **Management Information Systems**
- **Mark IV Programming**
- **Marketing**
- **Personnel**
- **Vehicle Management**

Successful candidates will have a B.S. degree or equivalent analytical experience. Actual programming should range from one to ten years. All programmers will work in an on-line environment on IBM 3033 equipment and must be experienced in all aspects of COBOL Expertise in IMS highly desirable.

At Federal Express our employees enjoy excellent compensation and one of the industry's most outstanding benefit programs. Join the excitement of Federal Express and experience the opportunity to excel in a fast-paced, rapid-growth organization.

To apply, please send resume including salary expectations in confidence to:

Suzanne Gaal
FEDERAL EXPRESS CORPORATION
Box 727, Dept. 0666
Memphis, Tennessee 38194

FEDERAL EXPRESS

America's airline for packages

Equal Opportunity Employer

PROGRAMMERS JOIN A WINNING TEAM

Become associated with the fast growing EDP division of one of the oldest and most respected temporary service companies in the area.

Assignments are at excellent rates on Micros, Minis and Maxis using all operating systems and languages. Pressing current needs are for COBOL on DEC-10 and IBM hardware as well as PDP-11.

Call Morris Lindman or Jim Waldron, (617) 890-7890.

SULLIVAN & COGLIANO
196 Bear Hill Road, Waltham, MA 02154

REGIONAL SALES MANAGERS

ASI TELEPROCESSING is a small, growth-oriented data communications company located in Boston, selling packet networks, audio response, and data collection polling systems to Fortune 500 end users. Primary industries include banking and retailing.

Immediate openings exist for Regional Sales Managers in the following areas:

MIDWEST, SOUTHWEST, WASHINGTON, D.C.
and METROPOLITAN NEW YORK.

The candidates should have at least 3-5 years' sales experience in minicomputers, terminals, front end processors, or data communications products. Excellent incentive plan and benefits. For appointment please contact James C. Rothrock, Vice President, Marketing, at (617) 923-1850.

ASI TELEPROCESSING
101 Morse Street
Watertown, MA 02172

Equal Opportunity Employer

APPLICATIONS AND SYSTEMS/SOFTWARE

PROGRAMMERS

ALSO: IMS AND DATA BASE SPECIALISTS; SYSTEMS ANALYSTS; CICS SPECIALISTS

★CALL COLLECT★

DAYS & EVENINGS SEVEN DAYS A WEEK—ALL YEAR LONG

NO RESUME NEEDED—
TELEPHONE INTERVIEW

609-881-2698
NOON TO 11 PM

NATIONWIDE (LOCAL OR RELOCATION) CONFIDENTIAL NO-FEE

We offer the only real alternative among fee-paid agencies *HERE'S WHY* 1 Because we are not a franchise or a branch we provide **TOTAL NATIONWIDE SERVICE** to relocatable professionals or those seeking new employment where they now live Regardless of where you live we can locate new job opportunities virtually anywhere in the United States Our horizons are unlimited! 2 We **PROTECT YOUR CURRENT JOB** by marketing only your professional skills 3 We have thousands of open job orders but we go further **ACTIVELY MARKETING YOUR SKILLS. 4. Because we conduct a thorough, no-nonsense technical interview over the phone, at no cost to you, YOU DON'T NEED A RESUME** to explore new job opportunities Whatever your experience - and wherever you live - **WE CAN HELP!**

CALL US NOW - AT NO COST - TO DISCUSS YOUR REQUIREMENTS

PROGRESSIVE MANAGEMENT
140 East Clinton Street, Clayton, NJ 08312
Telephone Interviews Only

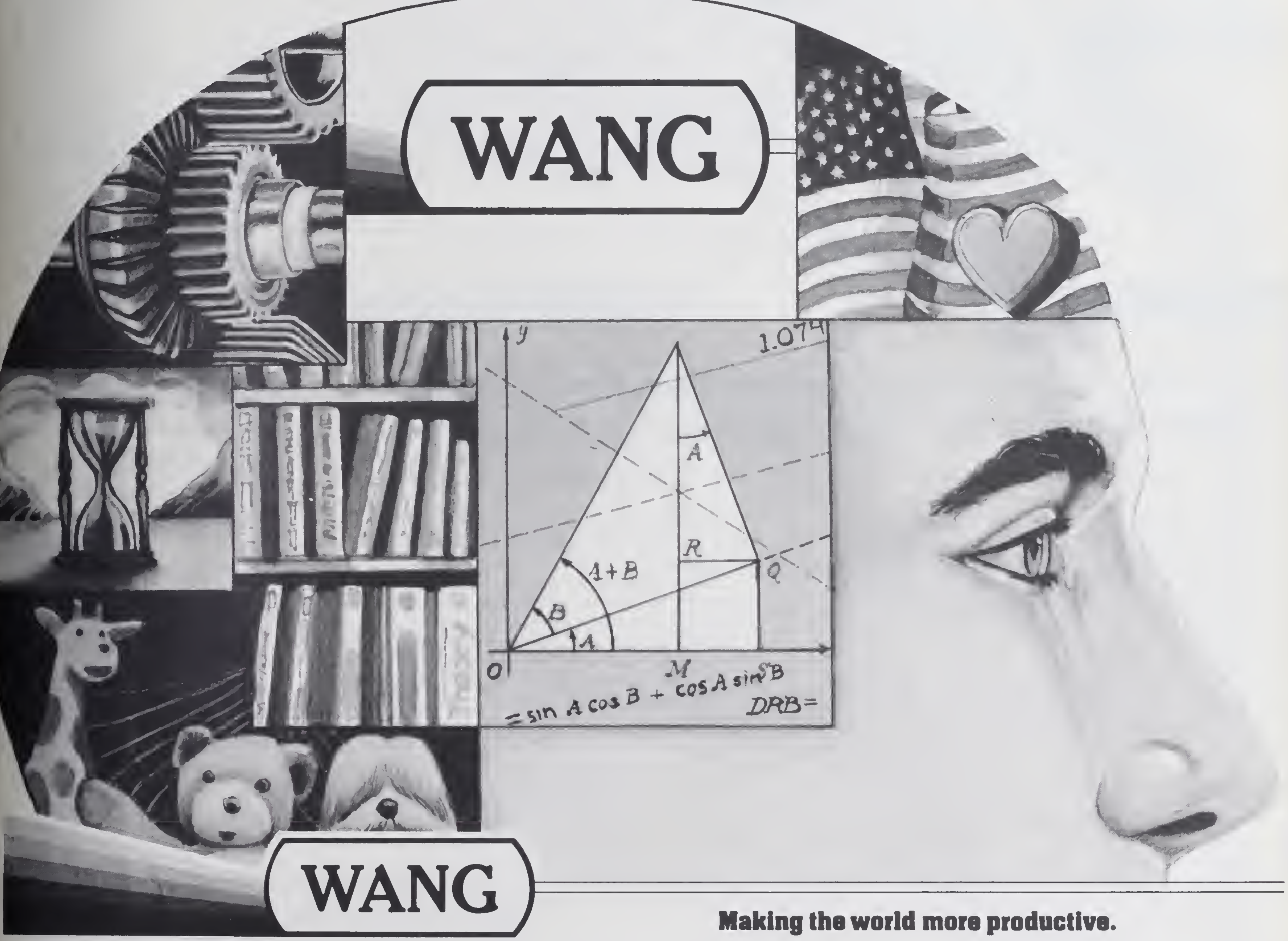
As a systems software developer at Wang, you'll get a chance to put your best new ideas to work on some of the most advanced areas in the computer industry, and to see your ideas turn into real products.

For example, we offer terrific opportunities in database management, language development, operating system development, performance analysis, firmware, networking, and more.

So if you're looking for a software development job that puts you on the leading edge of technology, you don't have to look any further than Wang.

For more information, contact Elaine Rosenberg, Wang Laboratories, Inc., Dept. C-1 One Industrial Avenue, Lowell, MA 01851. (617) 459-5000.

Wang's next software breakthrough may already be in your head.



Making the world more productive.

©1980 Wang Laboratories, Inc., Lowell, MA 01851 We are an affirmative action employer.

Systems Software Development.

Network Development Software Engineers/Computer Scientist

A number of challenging positions exist in our newly formed VS Network Development Group. If you have a solid background in the areas of network architecture and design, network control methods, or formal protocol specification and verification techniques, opportunities exist for you to participate in the design and implementation of the network architecture to support our highly successful 32-bit virtual memory VS computer line.

The ideal candidates will be systems-oriented generalists possessing an overview of data processing – operating systems, teleprocessing, data base management systems, having 2-4 years' related experience in a vendor or consulting environment or be performing relevant research in an academic environment.

Performance Analysis

Our newly formed VS Performance Analysis team is engaged in system level engineering design studies as an integral part of the overall development effort. The emphasis will be on global optimization, working closely with members of the Operating System, Data Base, Language, Firmware and Network organizations. Openings currently exist in the areas of modelling and workload categorization.

An Operational Analysis (Queing Theory) – based methodology is being developed to facilitate the interpretation of laboratory measurements and to study system performance. Applicants should have an advanced technical degree and an analytic background.

A procedure is being developed for categorizing commercial workloads and synthetically creating commercial environments in our laboratory. Applicants should have a technical degree and end-user experience.

Compiler Development Software Development Tools

Openings exist at both the management and *senior* and *junior* technical levels in the design, development, and support of compilers, run-time systems, and software development tools such as symbolic debuggers and source code maintenance facilities. Work is currently being done on PL/I, COBOL, BASIC, RPG-II, and FORTRAN-78. Our strategy is to emphasize the use of common compiler components and the use of high-level implementation languages whenever possible.

By design, all our programming languages will support common file structures, calling sequences, an innovative data base management system, forms management, and a common interactive symbolic debugger.

An MS in Computer Science or the equivalent experience is usually required. A small project team environment is emphasized and provides the opportunity for a high level of responsibility and visibility.

Our Computer Professionals Watch The Winter On The Eleven O-Clock News.

Come away with us to warm, fun-in-the-sun filled Southern California!

We're Carter Hawley Hale Stores, Inc., and if you know Neiman-Marcus, The Broadway, Bergdorf Goodman, The Emporium, Sunset House, Waldenbooks and John Wanamaker, you know us. Based in beautiful Southern California, we operate the most prestigious department and specialty stores in the country.

The big news, is that we're offering D.P. professionals the opportunity to work in our new, state-of-the-art suburban facility. Ours is a large IBM mainframe shop featuring up to date equipment including the IBM 3033 with OS/MVS.

And to help you keep pace with our technically advanced hardware, we provide on-going training and education programs..

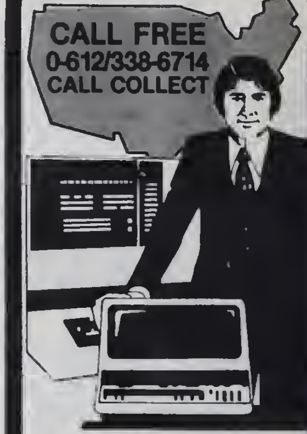
Carter Hawley Hale. We keep our snow in the mountains, and offer our employees competitive salaries, paid relocation, outstanding benefits, even employee discounts. It's a long time till summer, unless you're in California. Why put it off any longer? Invest a little time...reap career and living satisfaction.

We invite you to send your resume to Mr. Albert Quintanella:

CARTER HAWLEY HALE
STORES INC.
Information Systems Division
1600 N. Kraemer Blvd.
Anaheim, CA 92806

An Equal Opportunity Employer M/F

GET AN EDP JOB ANYWHERE IN



Analysts, project leaders, programmers with more than a year's experience let us help you find a better job. For a decade we have been placing EDP professionals like you all over the country through our network of 22 national offices. Send your resume or call.

Electronic Systems Personnel
1716 Midwest Plaza Bldg.,
Mpls., MN 55402

client companies assume our fee.

esp

EDP Placement Specialists

A member of National Computer Associates

DALLAS - FT. WORTH HOUSTON & SOUTHWEST

PROGRAMMERS One or more years experience in any of the following — COBOL — ALC — CICS IMS — DL/1 — PL/1	**18 to 30K**
SYSTEMS/PROGR'S Experience in CICS — IMS — SVS — MVS — JES II-III	**24 to 36K**
SYSTEMS/ANALYST New development in manufacturing, financial, banking, transportation, oil, consulting.	**25 to 32K**
SR. PROGRAMMERS/ ANALYST IMS — DL/1 — CICS — COBOL - New Development	**25 to 36K**

Our staff has a total of 23 years experience in the placement of EDP Professionals and a total of 18 years experience in the D.P. Industry, in programming, analysis, and management.

SEND RESUME TO

SEARCH & RECRUITING SERVICES
P.O.Box 340888
Dallas, TX.75234
or CALL COLLECT
(214) 579-7108

SEARCH REOPENED

College of Business Eastern Michigan University

Eastern Michigan University is accepting applications for the position of Head, Department of Operations Research and Information systems (ORIS). Twelve month administrative appointment. Appointment effective September 1, 1980. Responsibilities: Faculty personnel administration, budgeting and financial management; curriculum development; recruitment; develop and maintain rapport with local industry; promote, develop and expand Department and its professional image; maintain computer hardware laboratories; maintain standards of excellent among faculty and students; classroom teaching. Qualifications: Ph.D. in Information Systems, Computer Science, Operations Research, Statistics of Production Management, Research, Publication, and Professional activity or equivalent combination of education and experience in an appropriate academic field is required. Three to five years college teaching experience with classroom excellence required; sufficient experience to demonstrate administrative capability and leadership qualities. The Department of Operations Research and Information Systems has a full-time faculty of twelve of whom eight hold Ph.D.'s. In addition to the undergraduate major, the department offers a Master's degree in Information Systems (MSIS). Eastern Michigan University, established in 1849, is located adjacent to one of the world's greatest business and financial centers. Its four colleges and Graduate School have an enrollment of 18,000 students. Deadline for application: March 1, 1980. To apply contact:

Eastern Michigan University
Personnel Office
112 Welch Hall
Ypsilanti, Michigan 48197
(313) 487-3430

AFFIRMATIVE ACTION/EQUAL OPPORTUNITY EMPLOYER AND EDUCATIONAL INSTITUTION

ASSOCIATE PROGRAMMER

Responsible for design and development of software programs involving; standard configurations and selected environments for small and large scale computer systems. Tests accuracy of programmed segment. Corrects program errors. Coordinates with other Sperry Univac personnel. Requires B.S. degree in Computer Science, Mathematics or equivalent plus 1-2 years programming experience, or equivalent education, training and/or related work experience including six months to one year systems experience on large and small scale systems. Salary $350/week. 40 hours per week. Submit resumes to:

Ivan Reimer, Personnel
Sperry-Univac
1401 Sixth Ave
S. Clear Lake, Iowa 50428

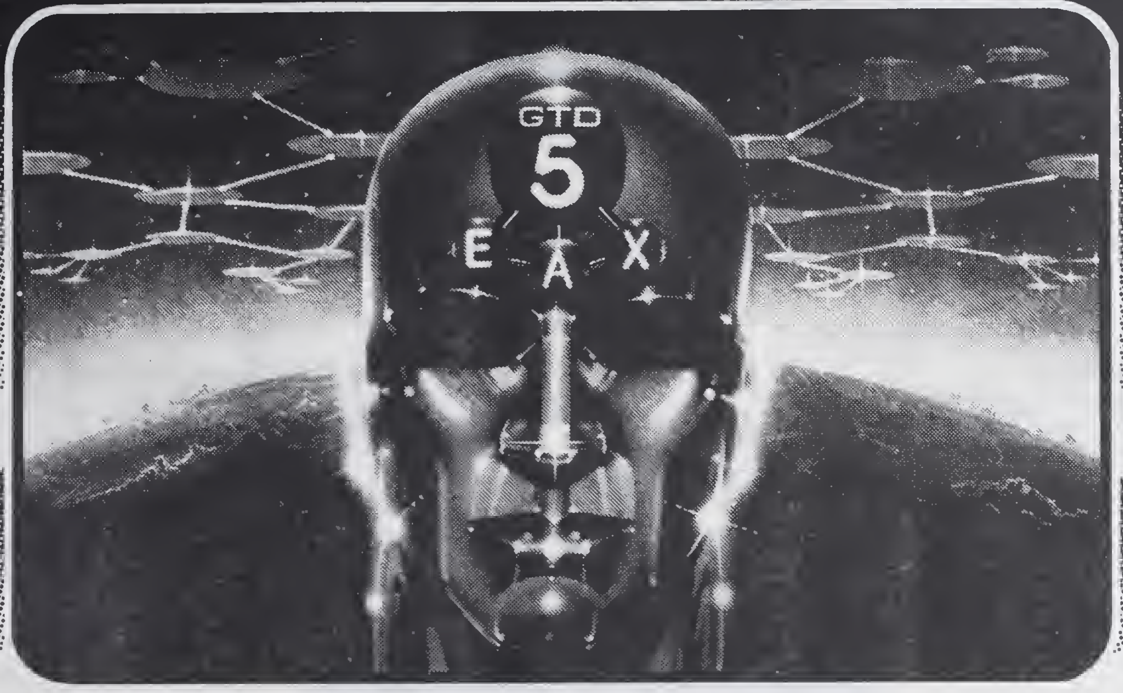
ASSISTANT DIRECTOR — TECHNICAL SERVICES
University of Kentucky
Institute for Mining and Minerals Research

Join an established energy research team in the heart of the Bluegrass with a unique opportunity to directly contribute to the solution of America's energy needs.

The Institute for Mining and Minerals Research operates the Kentucky Center for Energy Research Laboratory for the Kentucky Department of Energy. The Technical Services ASsistant Director will supervise the activities of up to 25 technical personnel providing publications, computer, electronics and machine shop services to engineers and scientists engaged in research, analysis, resource definition, mining, reclamation as well as the liquefaction and fluidized bed combustion of coal.

The qualified applicant will have a B.S. degree in engineering, mathematics, or the sciences and five years of computer system experience, preferably on the UNIVAC V-77, IBM 370/165, and/or HP 3330 with a background of scientific applications, real-time data acquisition, time sharing, TOTAL data base design, instrumentation interfacing, state-wide networking, graphics systems, micro computers, hardware and operating system design, and library information systems. He or she must be self-starting, capable of working with little supervision, and be able to communicate with both technical and non-technical personnel. Please send resume and salary history to the **IMMR Director's Office, P.O. Box 13015, Lexington, Kentucky 40583.**

An Equal Opportunity/Affirmative Action Employer M/F



SOFTWARE SPOKEN HERE

Come to GTE Automatic Electric Laboratories where challenging projects in multi-microprocessor design will allow you to explore your talents and have a hand in developing the communications systems of the future. The GTD No. 5 EAX, for example, enables us to establish a network of modular systems which can meet changing needs, dramatically enhance present capacities and make possible maximum integration of state-of-the-art hardware and software techniques. Working in a total R&D environment, you'll have a chance to see the results of your work first hand and to receive the kind of recognition you really deserve. We have current openings in the following areas:

Operating System Software

Responsible for task scheduling input/output status control and message handling software.

System Test and Control

Responsible for the system evaluation and test of large stored program switching system. The development and execution of computer system tests and performance tests in the laboratory and the field. Execute configuration management and control of all hardware, software and documentation.

On-Line Recovery and Diagnostic Software

Design of on-line recovery software to automatically identify the occurance of a hardware fault and to reconfigure the duplicated and/or redundant hardware into a fully operational system configuration.

Design on-line diagnostic software to automatically routine and localize hardware faults. Experience with recovery or diagnostic software in such areas as: CPU's, common memories, I/O, digital network complex, or line and trunk facilities is valuable.

Development Support Software

Responsible for the development of tools which aid and support the software developmeent of advanced digital telephone switching systems. Pascal experience and/or experience with PWB/UNIX time sharing systems desired.

Data Base Administration Software

Responsible for proposing a data base administration system for advanced digital systems. Perform logical and physical data base design.

Test Utility Software

Involved in design and software implementation of an automated, computer-based test system to be used in system evaluation and testing of laboratory prototypes and initial field site locations.

Call Processing and Administration Software

Involved in all areas of telephone switching control software, switch and network traffic overload management software, and system initialization and status control software.

If you'd like the chance to work on systems that go far beyond present state-of-the-art thinking and live in an environment that will meet all of your criteria for cultural and recreational opportunities, com to GTE in Phoenix today! GTE offers an excellent salary and benefits package. Please send your resume and salary requirements to:

**Mr. Dave Crowley
Manager of Employment, Dept. CMW114
GTE Automatic Electric Laboratories
11226 N. 23rd Ave.
Phoenix, Az. 85029**

GTE AUTOMATIC ELECTRIC LABORATORIES
INCORPORATED

REPUBLIC NATIONAL BANK IS DALLAS.

One of the largest banks in the Southwest invites you to join the sunbelt lifestyle of cosmopolitan Dallas.

Immediate openings are available for experienced managerial and senior level EDP professionals utilizing large scale IBM equipment under MVS, JES 2, IMS, CICS, ALC, COBOL, TSO, and SPF Software.

If your background includes:

- DATA BASE
- SOFTWARE SUPPORT
- CAPACITY PLANNING
- BANKING APPLICATIONS
- SYSTEMS DESIGN & IMPLEMENTATION
- PRODUCTION PLANNING & CONTROL
- MARK IV Internals

REPUBLIC can offer you an exceptional opportunity for a truly challenging growth environment with exposure to current state-of-the-art technology on a daily basis. Excellent salaries and benefits provide a highly desirable compensation package.

Republic National Bank of Dallas

REPUBLIC OF TEXAS

Contact:

Mr. Charles Kight,
Senior Vice President
(214) 653-5260
c/o Republic National Bank
P.O.Box 225961
Dallas, Texas 75265

An Equal Opportunity Employer M/F/H

SOUTHEAST OR SOUTHWEST

SALARIES $16-$35,000

We represent many major companies in the SE/SW. Want to come South? You can confidentially explore the entire market! All fees paid by client companies! 17 years DP experience! Contact Gary Little:

Recruiters, Inc.

Shel-Al-Bldg
11 West Oxmoor Road,
Suite 320 Birmingham Al. 35209
205/942-7829

SENIOR ENGINEERING TECHNICIAN

Performs subprofessional engineering, specializing in Civil Engineering related computer programming and graphics. Min. requirements: Bachelor's degree with course work in mathematics and computer science. One year experience in subprofessional Civil Engineering. One year experience in computer programming and applications. Previous experience in computer graphics or mapping, desirable. Substitution: two years of technical school training in computer operations, scientific programming and applications may be substituted for the Bachelor's degree requirement. Salary - $1,319.00 per month. **Application Deadline: January 31, 1980. Apply to the Adams County Personnel Dept., Admin. Bldg., 450 S. 4th Ave., Brighton, CO 80601. EOE**

COMPUTER SYSTEMS ANALYST

International marketing organization affiliated with the aviation industry, headquartered in Northeastern United States, has a position available for a Computer Systems Analyst. This is a newly created position with the following responsibilities:

- **Design, program, test and install new computer systems**
- **Maintain and enhance existing computer systems**
- **Review and benchmark computer software applications**
- **Manage 1 or more decentralized interactive computers**
- **Supervise contract programmer personnel, operations and computer input personnel**
- **Perform feasibility studies including cost analysis**
- **Maintain necessary vendor contacts to assure dependable cost effective support**

The position requires a college degree in business administration, math or engineering. Individual should have experience in one of the following environments: accounting, materials management, distribution or manufacturing. Individual must also be proficient in COBOL and one other computer language, as well as experienced on both "large frame" and "minicomputers." Successful candidate will also have several years of computer business experience.

We offer an attractive compensation package, extensive fringe benefits and a true opportunity for career growth with an "up and coming" company. To be considered for this position, please forward your resume, with salary requirements, in strictest confidence to **(dept CW:)**

CW Box 2169
375 Cochituate Rd. Rt. 30
Framingham, MA 01701

Employment Professionals $20 - $40K

Norton, Kleven & Co., Inc. has been providing Personnel Placement to Industry Nationwide since 1969. We are presently representing several firms (some exclusively) that need experienced employment professionals.

Our clients want individuals who have distinguished themselves, on the record and through accomplishments, as experienced employment professionals. Since the demand for these individuals far surpasses the supply, now is the time to make the career move you've been thinking about.

Recruiters at all levels- and Employment Managers- are needed by several companies right now. Compensation ranges from 22-40K, and many companies are offering bonus and stock options. Our clients are anxious to fill these positions, and will be available virtually anytime to conduct interviews.

Norton, Kleven & Co., Inc. understands the delicate nature of exploring new opportunities on the Professional Level. For this reason we see clients by appointment only (evening appointments available) and calls are accepted until 7:30 P.M.

For more information, please call or submit your resume to Angelo Buono. (617) 861-1020.

Norton, Kleven and Co., Inc.

INDUSTRIAL RELATIONS MANAGEMENT CONSULTANTS

Three Fletcher Avenue, Lexington, Massachusetts 02173
Telephone (617) 861-1020

Member
Massachusetts Professional Placement Consultants
National Computer Associates (Offices Nationwide)
Representing Equal Opportunity Employers M/F

MANAGEMENT INFORMATION SYSTEMS

High growth rate, Fortune 500 Company has immediate openings for experienced computer specialists.

- **PROJECT LEADER:** 8 or more years experience in analysis and programming, particularly manufacturing systems. Project leadership required. Comserv's AMAPS a plus.
- **PROJECT LEADER:** As above, but strengths should be in financial and personnel systems.
- **SENIOR ANALYST/MIS TECHNICAL SERVICES:** 7 or more years in systems and programming. Responsible for data base management, hardware utilization, programming standards, technical education, etc.
- **SENIOR ANALYST/PROGRAMMERS:** 5 or more years in systems and programming in a manufacturing environment.
- **ANALYST/PROGRAMMERS:** 3 or more years in programming general systems with financial or manufacturing exposure preferred.

Degree in industrial engineering, mathematics, business or computer science desired. Senior positions will find advanced degree a plus.

All positions must know COBOL and IBM OS/JCL. IMS a plus. HP-3000 experience also a definite plus.

Excellent salary and benefits. Creative working environment requiring flexibility and personal initiative. Submit resume and salary history to:

Bruce Kielty
Personnel Relations Dept.

Westinghouse Electric

4300 - 36th. St., S.E.
Grand Rapids, Mich. 49508

An Equal Opportunity Employer M/F

SOFTWARE PROFESSIONALS

This Is Where You Want To Be!
SPERRY UNIVAC
Technical Services Division

Sperry Univac's Technical Services Division is constantly growing and advancing the state of systems design, application analysis, programming, and a wide diversity of other software services to a large number of military, government agencies and industrial corporations.

We're currently involved with exciting new contract commitments and numerous existing projects where software professionals will really be able to put their skills to good use.

As our Technical Services Division continues to grow, our need for Programmers and Analysts also increases. Exceptional project opportunities also exist for systems development support personnel with experience in configuration management, software quality assurance and verification/validation.

Sperry Univac is the place to be for the salary, benefits, and advancement that come from joining an industry leader constantly on the move. Call today!

John DePrima
Toll Free: 800-336-0271
Or send resume to: John DePrima, Sperry Univac
1901 North Moore Street, Arlington, VA. 22209

SPERRY UNIVAC
TECHNICAL SERVICES DIVISION

An Equal Opportunity Employer M/F/H

LOCATION	PROJECTS/APPLICATIONS
Southampton, PA	Software support of The Naval Air Development Center involving Systems Readiness Test Development, Antisubmarine Warfare Systems, Airborne Data Processing Systems, and Software Life Cycle Support.
Washington, D.C. Suburbs	Various applications on Univac commercial and military computers. Projects include communications, simulation and Univac 1100 systems software.
Lexington Park, MD	Total systems support for Navy Command & Control and Tactical Data Systems. Work also involves scientific programming and the development and maintenance of government management information systems.
Dahlgren, VA	Software development services for the Naval Surface Weapons Center. Applications involve real time gunfire control and missile fire control systems and scientific programming.
Virginia Beach, VA	Software support for Naval Tactical Data Systems. Operational and simulation programs utilizing various Univac military computers.
Dayton, Ohio	Univac 1100 systems software development and maintenance, Performance evaluation, EXEC 8 modification, SYSGENS, hardware/software problem isolation and customer consultation.
Orlando, FLA	Software development for real time communication systems utilizing Univac AN/UYK-20 minicomputer system.
West Point, NY	Conversion from Honeywell 6620 to a Univac 1100/22 computer system utilizing DMS-1100 data base management system.

WELCOME 1980 in SAN FRANCISCO BAY AREA

The demand for skilled EDP professionals continue to exceed the supply. If you have banking, insurance, manufacturing, or retail experience as a:

SYSTEMS PROGRAMMERS	**To $32,000**
PROG. ANALYSTS/LEADERS	**To $30,000**
EDP AUDITORS	**To $35,000**
RPG II PROGRAMMERS	**To $25,000**
TESTING ANALYSTS	**To $25,000**
COMPUTER OPERATORS (IBM OS or Burroughs)	**To $18,000**

Numerous opportunities for IMS, OS COBOL, IBM 370, Burroughs, and System 3 experience. Call us collect:

ROBERT HALF OF NORTHERN CALIFORNIA
EDP SEARCH SPECIALISTS

Rich Abreau or
Jim Dupre
2 Palo Alto Sq. #212
Palo Alto, CA 94304
415-493-8700

Jerry Anderson or
Bob Couch
111 Pine St. #1510
San Francisco, CA 94111
415-434-1900

We're the experts in our field for experts in all of these.

- BANKING FUNDS TRANSFER
- SYSTEMS ENGINEERING
- OPERATING SYSTEMS DEVELOPMENT
- NETWORK DEVELOPMENT
- BIOMEDICAL DEVELOPMENT
- DATA BASE DEVELOPMENT
- ELECTRONIC MAIL/WORD PROCESSING
- MICRO LANGUAGE DEVELOPMENT
- CAD/CAM
- MANUFACTURING APPLICATIONS
- SCIENTIFIC PROGRAMMING
- POS/CREDIT AUTHORIZATION
- MARKETING SUPPORT
- COBOL PROGRAMMER/ANALYST

Salaries range $20-45,000 for technical contributors to senior management. Call collect **(617) 273-1740** or submit resume. Available Monday & Wednesday evenings until 8 PM E.S.T.

Management Advisory Services Inc.
"The Recruiting Firm for the Computer Professional"
16 New England Executive Park, Burlington, MA 01803.
Clients assume all fees and relocation expenses.
Executive search and placement consultants, representing equal opportunity employers.

SOFTWARE ENGINEERING RESEARCH

IIT Research Institute (IITRI) is seeking qualified professionals to join an internationally recognized center in software engineering research and technology. The Data and Analysis Center for Software engineering research and technology. The Data and Analysis Center for Software (DACS) serves as a focal point for the acquisition, analysis, and dissemination of information and data on software technology. Team members have a unique opportunity to work with the leaders in the software technology field; to evaluate software engineering methods and practices, and to participate in national software technology activities.

The DACS is operated by IITRI in Rome, New York. The varied research opportunities include the following:

***Survey the state-of-the-art in software engineering research. Evaluate these research projects and summarize results.**

***Evaluate, refine, and develope software reliability, cost and complexity models using historical data collected during the development and maintenance of a variety of software projects.**

***Initiate an active data acquisition program. Identify potential data sources from the government, industry, and academia; evaluate applicability to software engineering research; and establish mechanisms for acquiring the data.**

***Using the DACS' comprehensive historical database, evaluate the effects of modern programming practices on the software life cycle.**

Persons applying for these positions require a Bachelor's or Master's degree. Applicants must be interested in computer software technology and be able to communicate technical ideas in a clear and concise manner. Applicants must have experience and/or education in one or more of the following areas: information management, software engineering research, applied mathematics, database management, and software development.

IITRI ranks as one of the largest and best known not-for-profit contract research organizations and continues to extend its capabilities to effectively meet research challenges of our changing society and offers a complete benefit package including 100% tuition reimbursement and full relocating expenses. Please send your resume and salary history in confidence to:

IITRI

Lorraine M. Duvall
IIT RESEARCH INSTITUTE
The Beechea Carriage Suite
Turin Road
Rome, New York 13440
An Equal Opportunity Employer M/F

Anyone can find jobs in data processing. But, the really good positions are hard-to-find.

Robert Half offices have specialized in finding the best edp positions for more than 30 years . . . since it all began. We have 70 conveniently located Robert Half offices in the United States, Canada and Great Britain. Look us up in the White Pages.

ROBERT HALF
data processing and financial personnel specialists

ALBUQUERQUE • ALLENTOWN • ATLANTA • BALTIMORE • BIRMINGHAM • BLOOMINGTON (MN) • BOSTON • BUFFALO • CHICAGO • CINCINNATI • CITY OF COMMERCE (CA) • CLAYTON • CLEVELAND • CLIFTON (NJ) • COLUMBUS • DALLAS • DAVENPORT • DAYTON • DENVER • DES MOINES • DETROIT • FORT WORTH • FRESNO • GRAND RAPIDS • GREENSBORO • HARTFORD • HAYWARD • HOUSTON • INDIANAPOLIS • KANSAS CITY • LANCASTER • LEXINGTON • LONG ISLAND • LOS ANGELES • LOUISVILLE • MEMPHIS • MIAMI • MILWAUKEE • MINNEAPOLIS • NEW ORLEANS • NEW YORK • OMAHA • ORANGE (CA) • PALO ALTO • PHILADELPHIA • PHOENIX • PITTSBURGH • PORTLAND • PROVIDENCE • SACRAMENTO • ST. LOUIS • ST. PAUL • SALT LAKE CITY • SAN ANTONIO • SAN FRANCISCO • SAN JOSE • SCHAUMBURG (IL) • SEATTLE • STAMFORD (CT) • TAMPA • WASHINGTON, D.C. • WILMINGTON
• CANADA: CALGARY • TORONTO • VANCOUVER
• GREAT BRITAIN: BIRMINGHAM • LONDON

OIL & GAS

Due to continuad growth wa have craatad two SR. ANALYST positions to play key rolas in tha dav and implemantation of eithar an oil and gas laasa profitability systam, or a gas plant analysis system.

Raquiramants includa currant cobol, 2 yrs. oil and gas systems, and 3 yrs. analyst axperianca

We offar an attractiva salary, axcellant benafits, and environment whara your contributions will ba racognizad and rawarded

Please send your resume to P O Box 31049, Leanne McKinley, Dallas, TX. 75205.

DORCHESTER GAS CORP

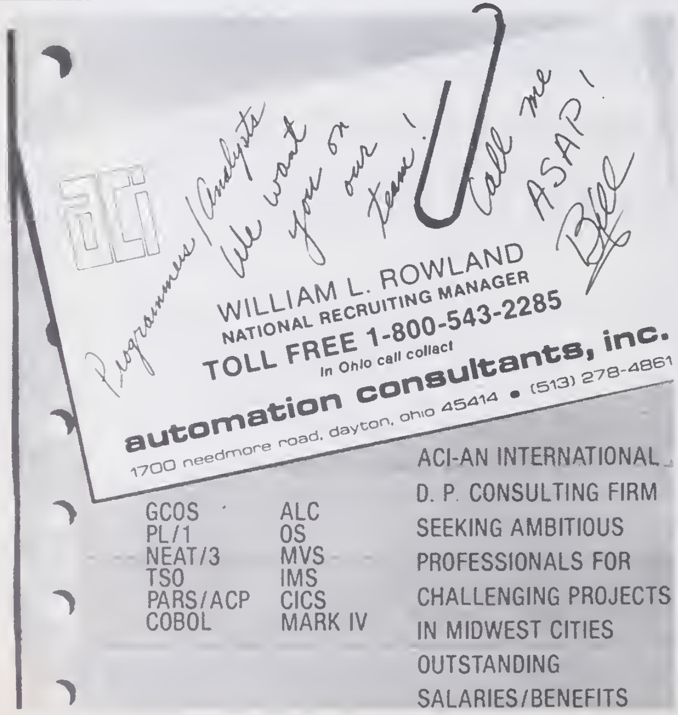
Wa ara an Equal Opportunity Employar M/F

PROGRAMMER SYSTEMS/ANALYST

If you have the following skills
. . .RPG IBM S/34
. . .IBM SERIES 1 COMM, EDX
. . .IMS APPLICATIONS
& INTERNALS

Join an outstanding firm and earn top $$$'s

Call Gad Janay — President
or George Collet — Chairman
(212) 228-5502
or write
MAGDA CORP
77 E 12th St. NY 10003



Programmers/Analysts We want you on our team! Call me ASAP! Bill

WILLIAM L. ROWLAND
NATIONAL RECRUITING MANAGER
TOLL FREE 1-800-543-2285
In Ohio call collact
automation consultants, inc.
1700 needmore road, dayton, ohio 45414 • (513) 278-4861

GCOS
PL/1
NEAT/3
TSO
PARS/ACP
COBOL
ALC
OS
MVS
IMS
CICS
MARK IV

ACI-AN INTERNATIONAL
D. P. CONSULTING FIRM
SEEKING AMBITIOUS
PROFESSIONALS FOR
CHALLENGING PROJECTS
IN MIDWEST CITIES
OUTSTANDING
SALARIES/BENEFITS

OREGON

Manager, Systems and Programming

Environment: Project teams; structured COBOL, DOS/VSE, ICCF, IDMS, 370-148; Worlds largest HMO.

Responsibilities: Staff of 14; project managemant; forecasting and controlling budgets; heavy usar communications, documentation; standards; "your shop."

Qualifications: 7 or mora years of increasing data processing experience; at least 2 years of supervisory or management experianca; experience in project managemant of computar applications is raquired; good technical and peopla skills required.

Apply:

KAISER-PERMANENTE MEDICAL CARE PROGRAM
Personnel Department
1500 SW 1st Avenue
Portland, Oregon 97201
503-224-3400 ext. 484

An Equal Opportunity
Employar/Handicapped Hired

EDP MARKETING NYC—PHILA—WASH

Fox-Morris Associates, nationally recognized as leaders in EDP sales placement, currently has numerous attractiva sales/markating positions available in the New York-Phila-Wash, D.C. corridor, including the following:

Terminals Sales Rep — NYC	**$45,000**
Remote Computing Branch Mgr — Phila	**$40,000**
Remote Computing Sales Rep — NYC	**$40,000**
Computer Systema Sales Engineer — Wash	**$40,000**
Peripherals Sales Rep — Wash	**$35,000**

Client cos pay all amployment costs. Contact, in confidenca, Don Owans, (215) 561-6300.

FOX-MORRIS ASSOCIATES
1500 Chestnut Street,
Phila., PA 19102

ST. LOUIS

Tha Midwast's finast city offars outstanding opportunitias for computar professionals with tha following backgrounds

Honeywall GCOS COBOL	to 27k
IBM 370, 303X COBOL, IMS	to 28k
IBM 370, 303X AL, MVS	to 28k
DEC PDP 11 RSX, MACRO 11	to 30k
DEC PDP 11 RSTS, BASIC	to 25k
DEC VAX COBOL, Fortran	to 25k
IBM Serias 1 COBOL	to 25k
Burroughs B6800 COBOL	to 23k
Manufacturing Analyst	to 35k
Banking Analyst	to 30k
Haalth Cara Administrator	to 25k
D.P. Systems Sarvice (IBM, CDC)	to 35k
D.P.Managar (Univac)	to 31k

Many ara naw installations with stata-of-the-art approach. Contact:

OBJECT Associates
2800 S. Brentwood
St. Louia, MO 63144
(314) 962-3100

a faa paid amploymant sarvice

DuPage County, Illinoia. Director of Management Information Servicea - Salary $32,000 to $38,000. Position reports directly to County Board Chairman and is responsible for coordinating and establishing priorities for various management information systems available to county government. Requires extensive experience at a management level in data processing and thorough knowledge of system analysis, programming and computer operations. Interested candidates should submit their resume to:

Peraonnel Director
DuPage County
Peraonnel Director
421 North County Farm Road
Wheaton, IL 60187

DENVER, COLORADO OPENINGS FOR:

HONEYWELL 6000/L66 SYSTEM SUPPORT

Background in GCOS, GMAP, IDS I - II, TSS, TDS required.

HONEYWELL 6000/L66 SYSTEM PERFORMANCE MEASUREMENT

Hardware/Software Monitoring, Experience with GCOS and available
Software Monitoring Packages required.

HONEYWELL 6000/L66 APPLICATION SOFTWARE SUPPORT

Background in GCOS, GMAP, IDS I - II, Cobol, utilities required.

IBM System Performance
Measurement helpful.
Environment includes:
3 - Processor 6080
3 - Processor 66/OPS
Several Level 6 Minis

Good advancamant opportunity
for provan ability,
Send resumes to Box 388
Denver, Colorado 80201

An Equal Opportunity Employer

SYSTEMS PROGRAMMER

Clarkson Collega of Tachnology has an opening for a Systems Programmer having 2-3 yaars experlance with a major IBM systam. Rasponsibilities will include generation, support, and anhancamant of VM/370 and OS/VS1 on an IBM 4341, which will ba installed in June, 1980. Experience with telacommunications processing is desirabla.

The position offars an excellent benafit packaga and a competitive salary. Our employees ara encouragad to entar Bachalors, Mastars and Doctoral degraa programs. Please sand resuma and salary requiremants to:

Mr. Richard D. Valente
Assistant Director
Computing Center
Clarkson College
Potsdam, NY 13676

An Equal Employment Opportunity/Affirmative Action Employer.

COMPUTER PROFESSIONALS

Control Data Corporation's Professional Services has career growth opportunities in pre-sale, post-sale and consulting located throughout the United States.

APPLICATIONS

Applicants should have experience in one of the following areas:

- **PROGRAMMER/DESIGN ANALYSTS**

(Opportunities in Chicago, Cincinnati, Dayton, Los Angeles, Milwaukee, Minneapolis, St. Louis, San Francisco Bay Area, and Washington, D.C.)

COBOL, FORTRAN, BASIC
Interactive Information Systems
Quantitative Analysis
CDC 6000/7600, CYBER 70 or 170 series
IBM 360/370 OS, VS, MVS

- **DATA BASE ANALYSTS**

(Opportunities in Chicago, Detroit, Idaho Falls, Los Angeles, Minneapolis, Philadelphia, San Francisco Bay Area, Seattle, Wash., and Washington, D.C.)

COBOL, FORTRAN
Total, System 2000, IMS, SPSS

- **SOFTWARE DEVELOPMENT**

(Opportunities in Chicago, Cincinnati, Dayton, Detroit, Indianapolis, Los Angeles, Milwaukee, Minneapolis, San Francisco Bay Area and Washington, D.C.)

Requirements Analysis
General and Detailed Design
Systems Analysis
Project Leadership
Information Systems Implementation
Knowledge of Time Sharing Usage

OPERATING SYSTEMS

Applicants should have experience in maintaining, modifying or extending any of the following operating systems:

- **CYBER 17X, 6000 or other large systems with NOS, NOS/BE, SCOPE, KRONOS, or OS**

(Opportunities in Albuquerque, Boston, Chicago, Cleveland, Cocoa Beach, Fla., Dayton, Detroit, Hampton, Va., Houston, Idaho Falls, Laramie, Wyo., Livermore, Calif., Los Angeles, Macon, Ga., Minneapolis, New York City, Philadelphia, Phoenix, Seattle, St. Louis, San Francisco Bay Area, Tulsa, Ok., Washington, D.C. and Wichita, Kansas.)

- **System 370, 360 or OMEGA with DOS, VS1, VS2, SVS, or MVS**

(Opportunities in Dallas, Detroit, Kansas City, Los Angeles, Minneapolis, New York, Pittsburgh, Seattle and St. Louis.)

- **CYBER 18 or other minis with 1700 MSOS, RCOS, ITOS, or OS**

(Opportunities in Los Angeles, Minneapolis, New York City, Omaha, San Antonio, San Francisco Bay Area, and Washington, D.C.)

or have extensive assembly language on any of the above computers.

If you have experience in any of the above areas, we have openings located throughout the U.S. For immediate consideration, please send resume, salary history and geographical preference to:

CONTROL DATA CORPORATION

More than a computer company

An Affirmative Action Employer

Geno La Voie
National Staffing Consultant
Control Data Corporation
P.O. Box 0
Minneapolis, Minnesota 55440

OR CALL COLLECT:
(612) 853-8725

FOX AND ASSOCIATES

DATA PROCESSING RECRUITERS

ANNOUNCING A NEW ATLANTA MANAGEMENT INFORMATION SERVICES ORGANIZATION

TALLEY INDUSTRIES, INC., a 500 million dollar company, is moving its Management Information Services Organization to the Atlanta area. Fox and Associates has been chosen as exclusive search consultants to meet the challenge of this major staffing effort. This will be a large scale Honeywell environment. Honeywell experience not required. Many professional positions have been created.

Openings Include:

Senior Systems Analyst
Data Base Specialist
Senior Systems Programmer
Quality Assurance Analyst
Systems Analyst/Programmer

Senior Programmer
Manager Business Planning
Sr. Business Planning Analyst
Business Planning Analyst
Assoc. Business Planning Analyst

Director Corporate Systems Development
Company Director of Systems Development
Manager of Systems and Programming
Quality Assurance Administrator

This is an exclusive search assignment, you may respond in confidence to:

FOX & ASSOCIATES, INC. — EDP Recruiters
233 Peachtree St. — 2004 Harris Tower — Atlanta, GA 30303
or call:
404/659-4141

Programmer/Analyst

We are a progressive manufacturing firm in Orange City, Ia. in search of a Programmer/Analyst.

This position will involve programming and system design in a teleprocessing environment. We are currently utilizing an IBM System 3, Model 15D. In 1981 we will replace this hardware with an IBM 4331 System. Consideration will be given to applicants with 3-5 years RPG II or COBOL programming experience. Our organization has plans for a multitude of various applications and has made a strong commitment to our Data Processing function.

We can offer a salary which relates to experience, a very complete benefit program, and opportunity to grow in your career field, and a great community environment for family living.

Send your resume and salary history to:

Industrial Air Park
K-PRODUCTS, INC.
Orange City, Ia. 51041

AN EQUAL OPPORTUNITY EMPLOYER

Data Processing Professionals

Dallas & Houston

Immediate openings available in Dallas and Houston for both experienced and entry level applicants. Positions require a 4-year college degree and permanent U.S. residency or U.S. citizenship. Entry level positions require a major or minor in Computer Science.

General Business Applications Programmer/Analysts

Design, develop, and implement systems in support of worldwide general accounting, financial planning, cost accounting, personnel, facilities and marketing functions. Experience with IBM 370, minicomputers, IMS, COBOL, or DL/1 applications preferred.

Manufacturing Systems Programmer/Analysts

Design, develop, implement and support shop tracking, production planning and quality tracking applications for worldwide manufacturing systems. Experience with IBM 370, minicomputers, COBOL, PASCAL, IMS or DL/1 applications preferred.

Scientific Applications Programmers

Develop and support computer aided design and interactive graphics applications. Experience with IBM 370, minicomputers, COBOL, FORTRAN, PASCAL, data base management, numerical methods and structured programming preferred.

Data Base Analysts

Design, develop and support IMS data bases and support programmers with consultation, debugging and design assistance. 3-5 years experience with DL/1 applications programming and IMS data base design required.

Data Base Development

Design, implement and support new CODASYL data base management system for the TI-990 series minicomputer with emphasis on support in a distributed processing environment. 5-8 years experience in data base systems implementation experience preferred.

MVS/JES 3 Operating Systems Internals

Modify and troubleshoot IBM operating system. 3-5 years experience with IBM operating systems and recent experience with MVS/JES 3 or TSO.

Office Automation Software Programmer/Analyst

Analyze, design and develop a word processing/data processing minicomputer system with an emphasis on evaluation and enhancement of performance. 3-5 years experience in multi-tasking, disk-based operating systems using Assembly language.

Internal Computer Systems Education

Teach and conduct computer lab workshop involving a broad base of computer systems technology. All education will involve internal systems and services personnel worldwide. Includes broad curriculum and technical assistance to key systems projects. Involves courses using the TI-990, IBM 370/3033/4331/4334 education.

If you wish to work in this highly motivating and challenging environment, send your resume in confidence to: John Heft/ P. O. Box 2103/Richardson, TX 75080.

TEXAS INSTRUMENTS
INCORPORATED
An equal opportunity employer M/F

ON-LINE APPLICATIONS PROGRAMMER

RANGER INSURANCE COMPANY is seeking a qualified On-line Applications Programmer with a minimum of 2 years CICS experience to work on our new Policy Management System package. Must have assembler language background in an environment with IBM 370/168 equipment or equivalent.

We are located in Houston, Texas and offer a good salary and excellent benefits. If interested contact:

John Wright, Manager of Recruiting
RANGER INSURANCE COMPANY
P.O. Box 2807 Houston, TX 77001

We Are An Equal Opportunity Employer M/F

ROBERT HALF

Now that you have your Christmas Bonus, take a good look at your future!

THE COMPANY:
This growth oriented mfgr is 100% committed to MIS Tired of depending on contract help. MIS expects to grow from 400 programs in '79 to 2000 in '85

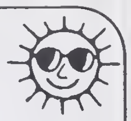
THE OPPORTUNITY:
Programmer/Analyst, APICS certified to handle design & programming of all inventory & mfgr systems.

THE MONEY: $30,000++

Call AMY NIELSON at:

Robert Half of Chicago
35 E. Wacker Dr.
Chicago, IL 60601
(312) 782-6930

MOVE SOUTH NOW!



Don't wait another winter! We work with over 1,000 sunbelt companies. Our computer will match your skills to their needs Client companies pay all fees Send resume to Data Processing Dept

LANDRUM
PERSONNEL ASSOCIATES
P.O. Box 1373C
Pensacola, Florida 32596
CALL TOLL FREE (800) 874-2407

Date Processing

ARE YOU READY TO STAND OUT?

Some things stand out in life — ads, people, careers and organizations. Our Data Processing Staff is visible and growing. So if you stand out in your profession, make yourself visible on our team. Our environment recognizes the individual accomplishments of our team members and we provide continual education and career development.

Currently we seek proven data processing professionals who have experience with large scale IBM hardware under OS/VS/MVS. IMS and TSO experience all pluses. We are interested in applicants with the following demonstrated abilities and experience:

SYSTEMS ANALYSTS

Will perform systems analysis and design, including user liaison and full systems documentation. These positions require 3-6 years D.P. experience and a minimum of 1 year analysis experience. Familiarity with PL/1 or COBOL desirable.

PROGRAMMER ANALYSTS

Will assist in systems design in documentation and will design, code and test programs. These positions require 2-4 years D.P. experience, previous analysis experience and proficiency in PL/1 a plus.

PROGRAMMERS

Will design, code and test programs. These positions require a minimum of 1 year experience. Proficiency in PL/1 and JCL a plus.

We offer excellent compensation and benefits to help you make your decision. TIME FOR A CHANGE? The Northern Trust Bank thinks so! Let us show you why . . .

Ms. Janice Rosenberg 312-630-6794
Mr. Dennis Hardeland 312-444-4861
(Collect calls accepted)

The Northern Trust Bank
50 South LaSalle Street
Chicago, Illinois 60675
An Equal Opportunity Employer M/F

If you prefer, send the following contact information to: Ms. Janice Rosenberg

NAME ______________________
ADDRESS ______________________
CITY ______________ STATE __________ ZIP ________
HOME PHONE ______________ BUSINESS PHONE ______________
POSITION APPLYING FOR ______________________
CURRENT POSITION ______________ # YRS. EXPERIENCE ______
CURRENT SALARY: $ ______________________

Computer Center Director

Columbus College in Columbus, Georgie, en urben stete college, is seeking a Computer Center Director to begin April 1, 1980. The Director reports to the President and is responsible for both edministretive end ecademic computing. A Doctorate end administretive experience is preferred. Salary is $25,000 to $30,000 depending on quelificetions. Applicents should be femiliar with COBOL, JCL for e mejor system, networks and common softwere peckeges.

Resumes and supporting documentetion including the nemes and addresses of three references, are to be sent to **Mr. Lon D. Marlowe, Chairman of the Search Committee for Computer Center Director, Columbus College, Columbus, Georgia, 31907. Closing Date: January 30, 1980.**

An Equal Opportunity/Affirmative Action Employer

SENIOR PROGRAMMERS

Successful Software development firm has immediate openings in our Albuquerque office for individuals who have demonstrated their ability to design, program, and implement complex management information and control systems. Candidates must be self-motivated, heve at least three year's experience working with COBOL and one year's experience working with CICS on large scale IBM equipment. Preference will be given to individuals with knowledge of database and indexed-sequential file processing. Excellent opportunities for persons who are seeking a challenging assignment in a vigorous and demanding work environment. Salary range to 30K depending on qualifications. Please submit resume, salary requirements and references in confidence to:

Curtis L. Wolfe, President
EXECUTIVE CONSULTING GROUP, INC.
40 First Plaza, Suite 50
Albuquerque, New Mexico 87102

Teleprocessing Software Specialists

$18-26,000
ATLANTA

One of Atlantas' finest data processing institutions is seeking 6 people experienced in systems software programming and development for front-end communications equipment. Company is installing COMTEN 3690's and seek similar experience, or experience with IBM 3705, or related front-end T.P. gear. Will do systems implementation, systems support, troubleshooting, networking, software program development and I/O drivers. Requires 1-4 years' related experience. Large scale IBM 370/3033 environment. Call or write:

BAI LIMITED

229 Peachtree Street N.E. Suite 2010 Cain Tower
Atlanta, Georgia 30330 (404) 581-0400
A Member of National Computer Associates Offices Netionelly

MAKE MEMPHIS YOUR FUTURE!

PROGRAMMERS . . . ANALYSTS

Join an outstanding data center with excellent growth opportunity. We are seeking individuals with 2 years of COBOL or IBM assembler language experience. Systems design or on-line experience is a plus. The responsibilities will include the installation of a new real-time system on our 370/148 in a DOS/VS environment.

We offer excellent salaries commensurate with your background and a top fringe benefit package. Interviews scheduled at your convenience. Please send resume or call: Personnel Manager.

LEADER FEDERAL
SAVINGS & LOAN ASSOCIATION
P.O. Box 3410
Memphis, TN 38103

901-523-2961

An Equal Opportunity Employer M/F/H

CSC

CSC-FOR THE CHALLENGE OF THE 80's

Computer Sciences Corporation, the world's leading independent company in the Information Sciences, has been, consistently, in the forefront for the development of high-performance computer software systems. The System Sciences Division of CSC is involved in some of the most exciting and enviable Space Science programs in the area of state-of-the-art Information Systems. We offer OPEN OPPORTUNITY for career advancement. Working in an atmosphere of a broad range of technical programs, your skills will continually increase and develop as you work with multidisciplinary teams of software specialists.

Current assignments with the NASA Goddard Space Flight Center require personnel with a B.S. or advanced degree in Meteorology, Mathematics, Physics, Computer Science or Electrical Engineering, with scientifically oriented software skills to work on programs such as Mission Support, Science and Applications, and the Goddard Real-Time System. We are seeking individuals with experience in one or more of the following areas:

HARDWARE: IBM 360/370/3033, PDP-11, VAX 11/70, UNIVAC 1100, SEL 32/55, SIGMA 5, AMDAHL 470/V6, INTEL 8080/8085, VARIAN, INTERDATA and MODCOMP.

COMPUTER APPLICATIONS: System Generation and Maintenance; FORTRAN, Assembly or PL/1 Programming; Computer Architecture & Design; Distributive Network Systems; Scheduling and Resource Allocation; Real-Time Command/Communication Systems; RealTime Operating Systems; Data Base Management; Modeling & Simulation.

SOFTWARE ENGINEERING TECHNIQUES: Requirements Analysis (SVD's, HIPO's); Structured Design; Design Verification; Hierarchical/Execution Diagrams; Programming Design Languages; Phased Implementation; Design and Code Walkthroughs; Decision Path Testing; Verification & Validation; Configuration Control.

CSC offers competitive salaries and a comprehensive benefits package which includes a structured professional development program, tuition assistance, liberal relocation, life insurance, and a major medical/dental and hospitalization plan. But most importantly, you will have the opportunity to apply your innovative capabilities to the challenges we'll be confronting together.

CALL OUR DIRECTOR OF PROFESSIONAL STAFFING: Toll Free: 800-638-0842
Collect: 301-589-1545 Or send your resume to Dept. C-520

COMPUTER
SCIENCES
CORPORATION

System Sciences Division
8728 Colesville Road,
Silver Spring, Md. 20910

Major Offices and Facilities Throughout The World

EQUAL OPPORTUNITY EMPLOYER M/F

ONONDAGA COMMUNITY COLLEGE
(Located in Upstate New York)
ASSOCIATE DIRECTOR, DATA PROCESSING
(SEARCH RE-OPENED)

Full time staff position which provides functional and supervisory support for the systems development, application and systems programming, and data base management activities of the Data Processing Department. This includes supervision of development and implementation of new and revised user projects.

Minimum qualifications include experience in: systems analysis and design; applications and systems programming and operations, with demonstrated proficiency in COBOL programming. Familiarity with data base management sytems as well as file, report and source document design preferred. Bachelor's degree is desirable.

Also desirable are: Previous experience in training, supervision and evaluation of programming, operations, and support staff, as well as proven abilities in written and oral communication skills.

The college currently has a Burroughs B1700 on-line computer system using the DMS II data management system.

Salary Range: $15,000-$18,000 per year
Deadline: January 25, 1980
Submit resume', three letter of reference to:

Director of Personnel Services
Onondaga Community College
Syracuse, New York 13215

RE: Associate Director, Data Processing

Onodaga Community College is an Equal Opportunity/Affirmative Action Employer

---

When you're trying to THINK

. . . of who handles most of the EDP middle and upper management opportunities in the New York, New Jersey, Connecticut area in the $25 to $65,000 range . . .

THINK

. . . of the Jarvis Walker Group

If you're moving to/back to this area, or just moving, why not call us and discuss your objectives. We think you'll be very pleased, and you can be fairly certain that we are handling your level of expertise.

the
jarvis walker
group

535 5th Ave., New York, N.Y. 10017 (212) 867-2650

SESA

INTERNATIONAL SYSTEMS and SOFTWARE CONSULTING FIRM

With a highly qualified staff of over 650 professionals in Boston, New York, Washington, D.C., France, West Germany and Belgium, SESA has achieved top recognition throughout its 15-year existence in the analysis, design and implementation of COMPUTER-BASED CUSTOM SYSTEMS and TURN-KEY PACKAGES.

To support our continuing growth, we seek high potential, self-starting individuals to fill the following positions in BOSTON.

EDP MANUFACTURING SYSTEMS PROFESSIONALS

- **Project Managers/Senior Consultants:** extensive experience (7 years) in the analysis, development and installation of computer-based manufacturing control systems, including MRP.
- **Systems Engineers/Consultants:** 3-5 years' experinece with minis and manufacturing.
- **Programmers:** 2+ years' experience with minis in business/manufacturing applications.

Successful candidates will be trained on our manufacturing control package (SESAP). The above positions require good communicating skills and involve some travel.

HONEYWELL LEVEL-6 SPECIALISTS

To perform the design and implementation of systems based on Level-6 computers. 3-5 years' experience required with on-line minicomputers, including at least one project where the candidate has been fully exposed to applying the entire range of capabilities of the Level-6 operating system.

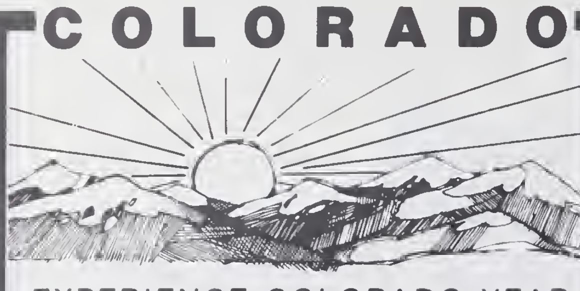
All our projects are designed, implemented and managed using SESA's rigorous, cost-effective proprietary method for software development: MELUSINE.
For manufacturing, as well as Level-6 positions, candidates should preferably have a degree in Computer Science, Business Management or related fields.
Starting salary will be commensurate with experience.
Please address all inquiries and resumes, in strict confidence, to Linde Matkowski, (617) 742-6620.
(No agencies, please)

SESA, INC.

89 State Street, Boston, MA 02109

An Equal Opportunity Employer

COLORADO



EXPERIENCE COLORADO YEAR ROUND. ENJOY SKIING UNSURPASSED ANYWHERE ELSE IN THE COUNTRY, ELK AND DEER HUNTING, FISHING, CAMPING, BACKPACKING, AND A HOST OF OTHER ACTIVITIES.

LOCATED WITHIN EASY DRIVING DISTANCE OF THE ROCKY MOUNTAINS AND JUST MINUTES FROM DOWNTOWN DENVER, TRI-STATE, A $550 MILLION DOLLAR ELECTRIC UTILITY COOPERATIVE, OFFERS QUALIFIED CANDIDATES THE OPPORTUNITY FOR PROFESSIONAL GROWTH IN THE FOLLOWING POSITIONS:

COMPUTER SERVICES MANAGER (EDP MANAGER) - plans, directs and coordinates the programming activities of a fifteen member Computer Services Department. Requires B.S. Computer Science or related field and a minimum of five years experience in total computer services including two years in supervisory position. MBA degree and REA experience desirable.

BUSINESS SYSTEMS ANALYST - functions as a liaison between users and EDP personnel in designing and coordinating programming. Requires B.S. Computer Science or related field and minimum three years business systems analysis experience including one year as a project leader.

ENGINEERING SYSTEMS ANALYST - analyzes and evaluates user requirements for engineering and real time - systems application. Requires B.S. Computer Science or related field and minimum three years experience in engineering systems analysis including one year as a project leader.

DEC experience desirable in all positions.

Tri-State offers a competitive salary, excellent fringe benefit package and paid relocation. Please submit resume with salary history to:

Tri-State Generation and Transmission Assn. Inc.
Personnel Dept. CW
12076 Grant Street
Denver, CO 80241

TRI-STATE
GENERATION & TRANSMISSION ASSOCIATION INCORPORATED

An Equal Opportunity/Affirmative Action Employer

ASSISTANT CORPORATE DIRECTOR COMPUTER SYSTEMS

A large and progressive consumer loan company (operating over 150 offices in 14 states) with Executive Offices located in the heart of Bluegrass Country, Lexington, Kentucky, is in immediate need of a shirt sleeve technician/manager to assist with the study, design, and implementation of information management systems servicing the executive and branch offices. This position requires the following:

- **UNIVAC OS/3, JCL, IMS, ICAM, BEM**
- **Proficiency in COBOL and RPG II**
- **Real-time interactive communications**
- **Comprehensive systems and managerial experience**
- **BS degree in Computer Science or related field preferred**

Send resume in complete confidence to Mr. W. B. Mullins, KFC Computer Systems; Kincaid Towers; Lexington, Kentucky 40508

KFC COMPUTER SYSTEMS

KANSAS CITY

Programmer Analysts

Blue chip Kansas City company seeks strong OS/COBOL background. Major expansion. Outstanding benefits.

Salary to Mid-$20's

6405 Metcalf Shawnee Mission, Kansas 66202, (913) 236-8288

DATA PROCESSING CAREERS inc

TULSA

OS/COBOL APPLICATIONS FOR ENERGY COMPANIES TO $28,000

A recent study in "Futurist" magazine rated Tulsa as the least economically distressed city in the country with a population exceeding 250,000.

2624 E 21st St, Tulsa, OK 74114
(918) 747-3621

DATA PROCESSING CAREERS inc

FT. WORTH

Major Expansion

Recent merger has created substantial growth opportunities for individual with COBOL/CICS skill, or knowledge of manufacturing applications. Salary to $24K.

Suite 911, One Summit Ave
Ft Worth, TX 76102, (817)336-4565

DATA PROCESSING CAREERS inc

DALLAS

Programmer

Dynamic, progressive company with all the bells and whistles of an IBM environment, needs COBOL experience with CICS application background. Interview and relo paid. Salary to $22K.

Suite 1109, Stemmons Tower W
Dallas, TX 75207, (214) 637-6360

DATA PROCESSING CAREERS inc

University of Puget Sound Tacoma, WA

Department of Mathematics/Computer Science

The Department of Mathematics and Computer Science of the University of Puget Sound invites applications for a tenure-track position at the Assistant Professor level. A Ph.D. in one of the Mathematical Sciences with a strong background and interest in Computer Science is required. The primary responsibility of the position will be to teach undergraduate Computer Science classes that lead to a B.S. degree in Computer Science/Mathematics. Salary commensurate with qualifications and experience. Excellent benefits. Start Sept. 1, 1980. Send applications by February 1, 1980, to:

Mathematics and Computer Science Search Chair
P.O. Box 7297
Tacoma, WA 98407

An Equal Opportunity/Affirmative Action Employer/Educator Ethnic minority and women applicants are encouraged to apply.

DATA PROCESSING OPERATIONS MANAGER

Eagle County Government is looking for an individual to manage and operate its new Wang computer. Applicant must have knowledge of programming and ability to facilitate minor hardware and software maintenance.

Send resume to:
Eagle County Government
Attn: Personnel Department
P.O. Box 850
Eagle, Colorado 81631

PROGRAMMER ANALYST
FLORIDA

Red Lobster Inns, the nation's largest, full service, sea food restaurant chain, has an opening in our IBM 370/148 VM OS for a programmer analyst. We offer you the opportunity to further develop your data-processing expertise in a very sophisticated results-oriented environment.

WE OFFER:

- Excellent benefits
- Paid relocation to Orlando, Florida
- Opportunity for promotion and continued career development

We are seeking a data processing professional with a minimum of 5 years experience in COBOL Programming (PL/1 a plus). Additional prerequisites include program development experience using CMS, excellent interpersonal skills, and exposure to systems design and project leadership in a 370 environment.

If you qualify, send your resume with SALARY HISTORY to Dept. NHJ, Red Lobster Inns, P.O. Box 13330, Orlando, Florida 32859.

Red Lobster®

An Equal Opportunity
Affirmative Action
Employer M/F/H

MIS Director

Verbatim Corporation is the largest manufacturer of removable magnetic data storage media for the computer industry with a growth rate in excess of 50% per year for the past 5 years.

We need a MIS Director with a BS or MS plus 7-10 years data processing experience, at least 3 of which must be in a management capacity in a manufacturing company. Duties include Data Center Management, systems planning and development, methods and procedures documentation, hardware and software selection.

Excellent salary and benefits including a substantial incentive bonus program and a stock purchase plan.

If you would like to be considered for this position, please send your resume, with salary history, to Hall Acuff, or phone (408) 245-4400, Ext. 270 for more information: VERBATIM CORPORATION, 335 Soquel Way, Sunnyvale, CA 94086. An equal opportunity employer M/F/H/V.

Verbatim
Removable magnetic storage media

Programmers

Senior ADP Systems Analyst

$23,952 - $28,908

The University of California, Irvine is now recruiting for a Senior Administrative Data Processing Systems Analyst for the College of Medicine.

The position will be responsible for the development and administration of Management Information Systems for the UCI College of Medicine and will involve the analysis of existing computer and non-computer administrative systems and procedures, the determination of the feasibility of utilizing new or improved computerized tools/techniques, and the recommendation for the adoption of new systems. Further, the incumbent will design procedures and programs; write, debug and implement computer systems.

The University of California, Irvine offers excellent benefits including a comprehensive insurance package, ideal location and three weeks paid vacation. Filing deadline: 1/25/80. Request required application materials for Job CP 116 from:

University of California, Irvine
Personnel Office
152 Administration Bldg.
Irvine, CA 92717

An Affirmative Action Employer

UCI

Data Processing Professionals

With Our Resources You Need Not Be Left Out In The Cold!

Tired of those long, cold winters? Consider a move to the San Francisco Bay Area and a beautiful, sunny, year-round mild climate. If you are a Data Processing Professional and have considered changing jobs, or even just wondered what other opportunities exist, Logical Options can be a valuable resource for you! As specialists in data processing career placement, Logical Options is continuously monitoring the DP job market in the Bay Area. We can assist you in matching your skills to the current job market.

If you are an experienced programmer or analyst, with a knowledge of COBOL, OS, JCL, ALC, IMS, DATA BASE SYSTEMS AND COMMERCIAL APPLICATION, don't waste your best resource!

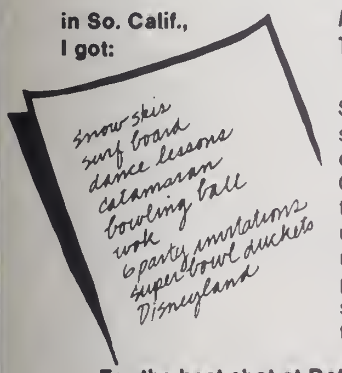
Call or send your resume.
Naturally, the fees are paid by the employer.

LOGICAL OPTIONS, INC

One Market Plaza, Spear Tower
Suite #2014 C
San Francisco, CA 94105
(415) 777-3900

XMAS '79

in So. Calif., I got:



AND I COULD CHOOSE ANY TO PLAY WITH THE NEXT DAY.

How did I get here? Started with some solid & sometimes boring experience back home. But it was Constellation Enterprises that made it happen. They understand the So. California Job Market, but as important as that, they understand what a major relocation effort is all about.

For the best shot at Data Processing work in 1980 in Southern California, call the best.

CONSTELLATION ENTERPRISES ☆☆☆☆ AGENCY

Fees and Relocation expenses paid by our client firms.

3250 Wilshire Bl. #1004C
Los Angeles, CA 90010
(213) 487-0616

Member of National Computer Assoc.
Opportunities Nationwide.

A Special Invitation

To computer professionals in the areas of:

Compiler Development
Language Design
Data Management

The Tewksbury facility of Digital Equipment Corporation is the focal point of our distributed and midrange systems development. Here, professionals work side by side to develop quality Digital products. And this is your chance to join us.

This invitation is open to individuals with proven capabilities in the specification, design, and implementation of computer languages and data management systems. Our expanding development has now created new development opportunities for you to work on state-of-the-art compilers, interpreters, language, debuggers, and advanced development activities for Digital's VAX-11 and PDP-11 systems.

We are interested in people with expertise in optimization, parsing, and data structure design working with languages such as PASCAL, PL/1, C, FORTRAN or ADA (DOD1).

Qualifications identified in your correspondence will be reviewed directly by the developers and managers of the development projects.

Your resume or letter identifying your qualifications should be sent directly to:

Digital Equipment Corporation
Language Development
c/o Norah Sutton
1925 Andover Street
Tewksbury, Massachusetts 01876

We are an equal opportunity employer m/f

digital

MAJOR NEW YORK CITY HUMAN SERVICES ORGANIZATION SEEKS ADMINISTRATIVE AND MANAGERIAL PERSONNEL FOR EDP SYSTEMS DEVELOPMENT

- **Computer Systems Director**
- **Project Control Director**
- **Computer Systems Analysts**
- **Management Analysts**

We seek staff with systems analysis, development, design and project control experience to plan and administer EDP systems development project for Human Services network.

Experience:

- **Directors:** 4-5 years EDP or managerial experience with MBA, MPA, MS or engineering degree preferred. B.A. or B.S. with experience also acceptable.
- **Computer Systems Analysts:** 2-3 years EDP or systems analysis background, degree preferred.

Salaries: From upper teens to low 30's. Excellent benefit package.

Please send resume to: **Box CW** 179, 810-7th Ave., NY 10019

Equal Opportunity Employer M/F

SYSTEMS PROGRAMMERS SAN FRANCISCO — BAY AREA

Move your skills to Northern California. We have a number of outstanding positions for system programmers in banking & manufacturing:

IBM DOS conversion to IBM 4300 DOS COBOL & BAL	**To $30,000**
DEC 2050 & TP (FORTRAN & ASSEMBLER)	**To $28,000**
PRIME COMPUTER & TP	**To $27,000**
IBM 3033, VM, CMS, TSO, Sr. Member.	**To $32,000**

We have numerous opportunities for DATABASE (IMS), EDP Auditors and Programmer Analyst.

ROBERT HALF OF NORTHERN CALIFORNIA
EDP SEARCH SPECIALISTS

Rich Abreau or
Jim Dupre
2 Palo Alto Sq. #212
Palo Alto, CA 94304
415-493-8700

Jerry Anderson or
Bob Couch
111 Pine St. #1510
San Francisco, Ca 94111
415-434-1900

Toll-Free 800-426-0342
PARKER PAGE ASSOCIATES

WEST - MIDWEST

Programmers — Los Angeles COBOL, CICS, IMS	To 25K
Programmers — Insurance OS/VS1 MVT COBOL	To 24K
Programmer — Phoenix Banking 370 DOS/VS	To 22K
Programmer/Analyst — San Francisco Insurance 3 years COBOL 370	To 25K
Systems Analyst — Midwest 370 DOS/VS Manufacturing	To 27K
System Programmer — San Diego DOS/VS CICS	To 28K
Software Project Leader — Memphis 370 OS/VS1 IMS 5 years exp.	Open
Systems Administrator — AERO SPACE 3033 OS/VS1	To 34K

SOUTH WEST

Programmer — Los Angeles 370, 4341 3 years exp.	To 25K
Programmer — Houston 370, 4341 3+ years exp	To 25K
Programmer/Analyst Houston OS/VS1 COBOL	To 30K
System Programmer OS/VS1 DOS/VS, MOS	To 26K
System Analyst Life Insurance	To 25K
System Analyst — Dallas Life Insurance CICS	To 25K
EDP Manager NCR 8550 5-7 years	To 35K
Salesmen Timeshare Hardware & Software	To 45K

NORTH EAST

APL Programmer — PA 3033 OS/MVS	To 30K
Senior Programmer OS/VS1, COBOL	To 28K
Senior Programmer/Analyst DOS/VS Banking	To 22K
Project Leader — New Jersey DOS/VS Banking	To 24K
DBA — Pennsylvania IMS 3033 OS/MVS	To 32K
System Analyst — Connecticut OS/VS1 Manufacturing	To 25K
EDP Auditor — Pennsylvania 35% Travel	To 27K
Tele-Communication Analyst Washington, O.C.	To 30K

Leo Webb
P.O. Box 12308
Seattle, WA 98111
208-822-4878

John Griffith
8420 Richmond Avenue
Suite #440
Houston, TX 77057
(713) 769-6530

Ken Carpenter
130 White Horse Pike
Berlin, NJ 08009
609-788-2222

SOFTWARE PROGRAMMER

Step into the '80s in Miller's State-of-the-Art Environment

Our ultra-modern data center can provide you with opportunity to write the software for technology that's on the leading edge of the next generation. At the center of Miller's sophisticated systems is the IBM 3033 plus an extensive TP network. If you're an experienced OS/VS systems programmer, you may discover a wide range of challenging responsibilities awaiting you int he OS/VS and telecommunications areas using MVS, JES II, TCAM, TSO, VTAM and NCP. OS/VS internals and/or telecommunications experience is desirable.

The advancement potential for your future career growth is as impressive as our dynamic and professional atmosphere. Combined with an excellent starting salary and comprehensive benefit package, Miller's opportunity is a career geared for the decade. Your resume, complete with salary history, will be held in the strictest confidence. Please write: **A. Akins, Dept 8004-0, Miller Brewing Company,3939 W. Highland Blvd., Milwaukee, WI 53201.**

Miller

Success...
It's a Matter
of People

An Equal Opportunity Employer M/ F/H

SOFTWARE DESIGN

As placement specialists to the computer industry in New England, our clients rely heavily on us to locate some of the most creative software personnel available to fill their key openings. Current, immediate needs are described below:

PROJECT MANAGER **To 38K**

Lead time in designing new generation of industrial process control equipment. Req. extensive exp. in microprocessor based controllers, user languages, and interactive graphics. Hardware knowledge helpful.

ASSEMBLY LANGUAGE PROGRAMMER **To 25K**

Sole software designer for new product. Must be capable of working independently and interfacing with engineering and manufacturing. 1-2 yrs. PDP-11/RSX-11M exp. necessary as is Macro assembler exp.

SOFTWARE SYSTEMS — PROCESS CONTROL **To 25K**

Consumer products division; rural, low cost of living area. Design and install real-time process control system. Fortran essential, HOL preferred. Requires 1-4 yrs. related exp.

SOFTWARE TEST ENGINEER **To 24K**

Program microprocessor debugging equipment for hardware testing. BSEE, logic knowleoge, TTL, and 1 year of experience with PDP 11 req.

TECH WRITERS **To 28K**

Openings exist for writers experienced in user manuals, operating procedures or marketing literature. Knowledge of computer architecture, operating systems or data communications required.

COMMUNICATIONS ENGINEER **To 35K**

Design distributed network systems. Communications protocols and routing, polling and resource allocation experiences essential. High level languages, especially PASCAL required.

If you would like further information concerning these positions, please call Dan Meagher at (617) 329-2660 or send your resume to:

EPRA

E.P. Reardon Associates

888 Washington Street
Dedham, MA 02026

COMPUTER PROFESSIONALS

LIFE IS BETTER IN DALLAS!
$18,000 TO $30,000

Since 1970 we have specialized exclusively in the successful counseling, representation, and career advancement of hundreds of computer professionals like yourself Currently we have numerous opportunities for

- COBOL, ALC (BAL), RPG, PL-1, FORTRAN Programmers, Programmer/Analysts
- IBM DOS, VM, OS/VS1, SVS, MVS, CICS, IMS System Programmers
- Mini Computers/Real Time Programmers
- Marketing/Marketing Support Reps

Send your resume or call us today! We know the Dallas data processing marketplace Fees paid by client companies.

dp **DataPro**
DATA PROCESSING
PERSONNEL CONSULTANTS

5580 LBJ FREEWAY — SUITE 650
DALLAS, TEXAS 75240 (214) 661-8600
Member of National Computer Assoc

SYSTEM 34
RPG II
$30,000

Upwardly oriented position available with this well respected firm. 3+ years RPG II programming with ON-LINE experience. Aid in development of applications on NEWLY INSTALLED SYS 34. Congenial atmosphere in professional environment.

NEVER A FEE
TO OUR APPLICANTS
Call: MARTY AMATO
Confidential **Professional**

ROBERT HALF
OF NEW YORK, INC. agency

522 Fifth Avenue
New York, NY 10036
212-221-6500

SYSTEMS PROGRAMMER

This position requires 5 or more years experience supporting DOS/VS, CICS and POWER/VS environment.

Experience with ETSS, DMS & APL system is a definite plus.

We are planning to convert to VSE and 4300 series next year.

Excellent company paid benefits including free parking.

If you meet these requirements, send resume with salary history and requirements to:

Personnel Department
U.S. NEWS
& WORLD REPORT
2300 N Street, NW
Washington, DC 20037

Equal Opportunity Employer

Systems Supervisor

TI in Johnson City, TN

Participate in the design, development and implementation of management systems for marketing, manufacturing and financial applications. Supervision of management systems programmer/analysts and distributed processing hardware headquartered in our Johnson City, Tennessee facility. Provide interface between site users and related functions in other TI locations. Experience in design and implementation of major manufacturing systems and experience in management technical support functions desirable. BA/BS in Computer Science or Engineering degree required. MBA/MS desirable.

Texas Instruments is building a new electronic technology center in Johnson City, Tennessee. Construction is already underway on a new 121-acre site set on the edge of the Appalachian Mountains. There's tremendous growth ahead, with a lot of room to move up in the beautiful Great Smokies.

This country is one of America's scenic treasures. In Johnson City, you are close to white water rivers, historic houses and villages, ski slopes and the Appalachian Trail. And Johnson City is a progressive, attractive city. It's a regional medical and educational center — the home of four hospitals, East Tennessee State University and one of the most highly rated school systems in the state.

TI Johnson City. A good move. Especially if you want to move up.

Call collect to Les Shroyer (617) 222-2800, ext. 3374. Or send your resume in confidence to: Don Colanton/34 Forest St., M.S. 12-3/Attleboro, MA 02703.

TEXAS INSTRUMENTS
INCORPORATED

An equal opportunity employer M/F

U.S. Senate
Programmer/Analysts/Training Specialist

Challenging career opportunities, at various levels, exist in our applications development/maintenance groups. Selected individuals will perform analysis, design, coding, testing, and documentation for new and/or existing application systems. Current applications deal with legislative and executive business, policy analysis, administrative and financial management, and office support and constituent services. Applicants must have 2+ years experience, preferably using CICS, COBOL/ALC, and M204 DBMS on IBM 370/MVS or compatible equipment. Experience in oevelopment/maintenance of large scale on-line information systems is highly desirable. Stating salary to high 20's.

Career opportunity also exists for an individual with B.S. (Masters preferred) and 2+ years experience in the development of technical course materials and the presentation of training classes to date processing professionals. Applicants must have prior data processing course development and presentation experience, preferably at the college level or in a data processing organization. Experience with video cassette training programs, career counseling, coordination of centralized technical library and ability to teach COBOL, CICS, ALC, VSAM and M204 DBMS are highly desirable. Starting salary to high 20's.

Current environment includes multiple IBM 370/158's running MVS with CICS and M204 DBMS supporting large Senate terminal network.

Applicants will not be reimbursed for interview and/or relocation expenses

Send résume including salary history to:

Director, U.S. Senate Computer Center
400 North Capitol St., N.W.
Washington, D.C. 20510

Detach here, moisten and seal envelope securely before mailing.

Fold and insert order form (attached through binding) and remittance here.

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 709 FRAMINGHAM, MA 01701

postage will be paid by

CIRCULATION DEPARTMENT
COMPUTERWORLD
375 Cochituate Road, Rte. 30
Framingham, MA 01701

DATA PROCESSING MANAGER

Prestige medium sized manufacturing facility requires professional D. P. Manager possessing knowledge of common data system and RPGII language. Candidate will be one who can successfully manage through written and verbal communications at all levels.

Possibly now the number 2 man ready to progress into a Manager's position. Specific experience must include material requirements planning, capacity planning, and manpower scheduling.

We offer an excellent fringe benefit package, growth potential and a salary commensurate with experience. Interested individuals should call A.S. Priola at (317) 632-8411 Ext. 416 for an interview appointment.

South Wind
STEWART-WARNER
SYMBOL OF SW EXCELLENCE

An Equal Opportunity Employer M/F

PROGRAMMERS AND ANALYSTS

Free Employment Service
Northeast, Southeast & Midwest U.S.

Scientific and commercial applications • Software development and systems programming • Telecommunications • Control systems • Computer engineering • Computer marketing and support.

Call or send resume or rough notes of objectives, salary, location restrictions, education and experience (including computers, models, operating systems and languages) to either one of our locations. Our client companies pay all of our fees.

RSVP SERVICES, Dept. C.
Suite 700, One Cherry Hill Mall
Cherry Hill, New Jersey 08002
(609) 667-4488

RSVP SERVICES, Dept. C
Suite 300, Dublin Hall
1777 Walton Road
Blue Bell, Penna. 19422
(215) 629-0595

RSVP SERVICES
Employment Agency for Computer Professionals

Houston or anywhere else!

The *premier* national dp recruiters have got a great job for you! In Houston or anywhere in the USA! Send your resume to:

DPC
The DPCenter
4151 SW Freeway
Suite 450
Houston, Tx. 77027
(713) 960-9102

Cochise College located in beautiful and historic southeastern Arizona is seeking a Programmer-Analyst. A bachelor degree in business or data processing is required. Candidates must possess 3-4 years previous programming experience with knowledge of COBOL. Duties will include design and implementation of a student information system, analyze and develop business and educational applications and programming

Salary $11,311 - $18,181/yr. (dependent upon experience)

Apply before January 21, 1980 to Personnel Office, Cochise College, Douglas, AZ 85807

Equal Opportunity Employer M/F

Exeter Associates

NATIONAL RECRUITING CONSULTANTS

BRUCE A. MONTVILLE
MANAGING PARTNER
(603) 926-6712

CONVERT TO SOFTWARE ENGINEERING

1 to 5 years experience in Commercial/Business applications can now be transferred to our forward thinking client's Software Engineering Department. You will be exposed to a multiple Hardware/Software Environment, including minicomputers and microprocessors.

Starting salaries range from $20,000 to $30,000

For prompt and confidential consideration, forward your resume or call us collect

P.O. BOX 623, COMPUTER PARK, HAMPTON, N.H. 03842
A COMPONENT OF EXETER INTERNATIONAL, INC.

Real-Time Process Control

BUSINESS SYSTEMS

MOVE TO FLORIDA

Personal and professional satisfaction, and a successful career path are vital reasons for considering a prospective employer. At Motorola, the industry leader in the design and manufacture of superior communications systems and precision components, we provide the climate necessary for individual achievement. We invite your participation in our continuing success.

- **Staff Analyst**
- **Lead Programmer Analyst**

Key positions in the development of distributed business systems to support a high volume, fully automated manufacturing facility. Both positions require demonstrated ability to design and implement systems which interface commercial applications residing on large main-frame computers with real-time, discrete process control applications resident on dedicated mini-computers. Experience with HP 1000 or PDP-11 operating systems, programming languages and data base managers preferred, with exposure to their use in networks centered on large scale IBM computers, an essential requirement. Knowledge of IMS DB/DC application design techniques would be a valuable asset in either position.

- **Sr. Programmer Analyst**
- **Programmer Analyst**

Essential requirements include experience with ANS/COBOL/OS operating systems and knowledge of JCL. Also preferred is a background in IMS/DLI, TSO/SPF, MFS, RJE and MARK IV. Exposure to manufacturing and/or financial application areas will be a valuable asset.

We are a company internationally known and well-positioned to offer the qualified candidate an excellent compensation program and outstanding career advantages. For consideration, forward resume, complete with salary expectations, in confidence to:

MOTOROLA INC.

Professional Staffing Dept. CW 114
Communications Portable Products Division
8000 W. Sunrise Blvd.
Ft. Lauderdale, FL 33322

An Equal Opportunity/Affirmative Action Employer

MOTOROLA INC.

UNIV. OF VERMONT USER SERVICES COORDINATOR

The Academic Computing Center seeks a person to conduct all activities pertaining to the delivery of computing services to the users of a OEC system 2060 and a Harris /7. Responsibilities include coordinating and supervising student consultants, advising users about mini/micro computer acquisitions, softwear packages and the capabilities of the two computing systems, scheduling non-credit short courses, and assisting in the planning for new or revised services. Applicants must have a BS degree in Computer Science or a related field and at least two years experience with FORTRAN on a time sharing system. Good communication skills and the ability to interact well with people are essential. The salary minimum is mid-teens and the benefits package is excellent. **Please send a cover letter, a resume and the names of three professional references by Jan. 25 to Will Clark, Employment Office, 237 Waterman, University of Vermont, Burlington, Vermont 05405.**

An Affirmative Action Employer

ROBERT HALF

PACIFIC NORTHWEST
Washington, Idaho & Alaska

A great place to visit — a better place to live. Healthy economy and environment.

Managers
Auditors
Analysts
Programmers

Visiting here? Call collect, send resume or drop in to talk over current job openings and set up interviews for you.

Ray Magill, CDP

ROBERT HALF
of Seattle, Inc.
1301 - 5th Avenue
Suite 2628
Seattle, Wash. 98101
(206) 624-9000

SYSTEMS PROGRAMMERS

If you are experienced with IBM 370/MVS/IMS or Honeywell 6000/GCOS/IDSII . . .if you'd like to work for one of the nation's largest corporations, with competitive salary, benefits and opportunities for advancement . . . if you can relocate to surprisingly livable Omaha, Nebraska . . . please send a resume to: Northwestern Bell, Management Employment coordinator, 100 South 19 Street, Room 1130 - Dodge Building, Omaha, Nebraska 68102.

An Equal Opportunity Employer

The University of Michigan-Flint

Computer Science Department

Applications are invited for tenure-track and visiting positions of Assistant or Associate Professor. Applicants should have a PhD degree in Computer Science, Electrical Engineering, or a related discipline. All applicants will be considered regardless of their area of specialization but preference will be given to those who specialized in software engineering, operating systems, systems programming, database management, computer architecture, computer design, mini-micro computer systems. Professional development is encouraged and expected but emphasis is on quality of teaching. One of three campuses of The University of Michigan, located on a new riverfront campus in downtown Flint, The University of Michigan-Flint offers degrees to over 4,000 undergraduate students and an increasing array of graduate and graduate/professional programs. The Computer Science Department has a Burroughs B1825 system, a logic lab and a micro computer lab. There are excellent facilities for accessing the Ann Arbor AMDAHL 470 system with access to TeleNet. The Department currently offers the BS degree in Computer Science with plans for a graduate program in Software Engineering.

Interested applicants should send a curriculum vitae and the names of three referees to:

Professor Nancy Martin, Chair
Department of Computer Science
The University of Michigan-Flint
Flint, Michigan, 48503

The University of Michigan-Flint is a non-discriminatory, affirmative action employer.

Project Leader
Word Processing Applications Software

NCR's new development group in Columbia SC offers total design freedom.

If you'd rather be defining a totally new WP system than coping with the limitation of some existing system, here's your opportunity. We offer all the resources, commitment and professional satisfaction you can ask for.

As the organization responsible for a giant computer company's entry into office Automation Systems, NCR Engineering & Manufacturing/Columbia gives you a chance to play a key role in a major new undertaking.

We are seeking a project leader who can be responsible for our new applications software group and architectural definition of Word Processing products. You will be overseeing the development of software modules and the Word Processing text editor. A detailed knowledge of data structures and text editing techniques is required — as is a background in the management and implementation of complex software systems.

Our location also offers notable attractions. Columbia is the home of the University of South Carolina, and we're within reach of the seashore and Great Smokies. Taxes are low and housing is affordable.

Please send full resume and confidential salary history to: Ken Uhlig, Word Processing Department E50, NCR Corporation. 3325 Platt Springs Road, West Columbia, S.C. 29169.

NCR

Complete Computer Systems

An Equal Opportunity Employer M/F

MANAGER-CORPORATE MIS CONSULTING

Salary Range $40,000 – $50,000

Our diversified client, with ten major operating divisions, is seeking a unique combination of background and experience to manage a new internal consulting group. The charter of the group will be to design, develop and introduce to senior line managers, state-of-the-art business and financial planning applications in an interactive mode.

In addition to sound managerial and EDP technical credentials, the ideal candidate would also have background in consulting (internal or external), modeling, timesharing, and data base. Strongly prefer an MBA. Midwest location.

Call Or Write Michael Zinn

halbrecht & co.

201 East 42 Street, Suite 1705,
New York, N.Y. 10017, 212-682-3333

Developers of the computerized EDP mgt. Registry

Computer Professionals

Deere & Company, a leading manufacturer of agricultural equipment, has openings for the following positions:

SYSTEMS ANALYSTS

You must have a minimum of 2 years experience, including IMS and COBOL, in an IBM environment, preferably in manufacturing areas. Responsibilities will be varied.

PROGRAMMERS

Prefer a minimum of 2 years experience including IMS with IBM equipment plus a knowledge of COBOL in a manufacturing environment.

We offer qualified candidates excellent starting salaries and comprehensive company-paid benefits including paid relocation to Iowa. For consideration, direct your inquiry with salary history to:

JOHN DEERE

Ronald H. Like
Dept PE-92
Deere & Company
Moline, Illinois 61265

An Equal Opportunity Employer M/F

Data Processing

MINICOMPUTERS **MICROPROCESSORS**

If you are an aggressive, ambitious

PROGRAMMER/ANALYST

Interested in

- **Real Time Process Control Systems**
- **Mini Computers based with remote micro-computer interfaces**
- **Total Project Involvement**

Design
Programming
Implementation

And you have:

- 3-5 years assembler language programming with design involvement
- A degree in engineering, math or related area
- Data General or Intel programming experience a plus

CONSIDER IOWA BEEF

- A company with 1979 sales figures exceeding $4 billion
- A company with a two year growth rate of 100%
- Committed to full implementation of NEW COMPUTER SYSTEMS for all areas of our operations

WE CAN OFFER

- Top salary plus annual cash bonus
- Profit sharing
- Stock Options
- Excellent benefits
- An environment guaranteed to challenge your business and technical expertise and reward your accomplishments.

Let's Talk

Call Collect: 402/494-2061

Walt Maciag

Or send resume in confidence to: **Walt Maciag, IOWA BEEF PROCESSOR INC., P.O. Box 3350, Sioux City, IA 51101.** An Equal Opportunity Employer m/f.

WE HELP FEED AMERICA
IOWA BEEF PROCESSORS, INC.

IOWA BEEF PROCESSORS, INC.

ibp

FLORIDA!
DATA BASE IS YOUR KEY

Vigorous expansion and new development of major Data Base Systems at several of Florida's largest data processing employers has created a critical shortage of experienced Data Base professionals. Immediate openings exist in Miami, Ft. Lauderdale, Orlando and the Tampa Bay area. These positions are with some of Florida's most progressive companies, offering:

NATIONALLY COMPETITIVE SALARIES!
EXCELLENT COMPANY BENEFITS!
TECHNICALLY ADVANCED, STATE-OF-THE-ART WORKING ENVIRONMENTS!
A YEAR ROUND LIFESTYLE THAT CAN'T BE BEAT!

Salaries from $20,000 to $35,000 for any of the following:

IMS design, Project Management. Spearhead a major IMS DB/DC development project. Assume a leadership role with this dynamic Fortune 500 company.

IMS applications development, Lead Programmer/Analyst. Teach junior programmers, move quickly into a supervisory position. Knowledge of COBOL and OS JCL required, minicomputer and distributed systems experience helpful.

IMS internals knowledge, Technical Support. Gens and op. design, knowledge of data base access methods. TOP DOLLARS for these key professionals.

Any IMS applications programming or design experience. Knowledge of COBOL and OS JCL. BAL, TSO and/or CICS a big plus.

DMS 1100, Univac, Data Base Analysts. Applications development and/or technical support. Knowledge of COBOL required. Rapid advancement is assured in this dynamic growth company.

Our client companies pay all fees plus relocation and interviewing expenses. To avail yourself of these outstanding opportunities, call or send resume in STRICTEST CONFIDENCE to:

JAMES A. WARD
& ASSOCIATES
1150 N. Federal Highway, Suite 811
Ft. Lauderdale, Florida 33304
(305) 764-5601

D.P. MANAGER

Min. 2 yrs. mfg. & survey exp. is ideal for this management pos. $20mm division needs shirtsleeve supvr. to handle day-to-day resp. as well as design & implementation of a wide range of systems. Reports directly to VP Finance. $25,000. Fee paid. Contact Pam Siegal.

Robert Half of Buffalo, Inc.
Agency
1310 Liberty Bank Building
Buffalo, NY 14202
(716) 842-0801

LEAD PROGRAMMER — Responsibilities: Maintain production programs and provide technical and functional direction in the development of new programs. **Duties:** Collaborate with levels of programmer analysts, project management and other technical personnel in project resource scheduling, hardware/software analyses, feasibility studies and applications systems planning; establish standards for block diagramming, flowcharting and coding; select program language, standard subroutines and other programming aids; defines computer controls and I/O specifications; prepares weekly progress reports; recommend technical training requirements. **Requirements:** 4 years programming experience. Experience with more than one programming language necessary. Statistical, mathematical and logical aptitudes required. Salary from $18,000 to $25,000.

SENIOR PROGRAMMER — Responsibilities: Programming activities within the specifications of the project schedule. **Duties:** design data codes and files; write and debug complex programs and subroutines; verify program logic by preparing test data for system and parallel testing; troubleshooting; specifies and organizes I/O control procedures; develop operations program and systems documentation; prepare weekly progress reports. **Requirements:** Minimum 2 years programming experience in COBOL and 1 year with present types of hardware and software. Salary from $15,000 to $21,000.

PROGRAMMER ANALYST — Responsibilities: Analyzing, determining and defining the pertinent specifications of information requirements and operational needs. **Duties:** Assist in coordinating technical activity with other departments; organize information into accessible master and work files; prepare flowcharts and block diagrams for program specification development; write and debug complex programs and subroutines; prepare and develop operations, program and systems documentation and assist in developing of user documentation; act as technical leader for programmers; prepare weekly progress reports. **Requirements:** Knowledge of existing hardware/software and 2 years experience using COBOL in analysis, design, programming and systems installation. Salary from $15,000 to $21,000.

If you qualify for any of the above positions, please send resume to **Mr. Dennis Slern, Zayre Corp., Home Office Personnel, Framingham, MA 01701.** Equal Opportunity Employer M/F.

DATA COMMUNICATIONS SPECIALISTS

Experience in. . .
Data Communications Products
Data Communications Systems Design
Systems Implementation
Knowledge of Data Communications Protocols
Some Assembler-level Computer Programming
End-User Sales or Sales Support is Highly Desireable

College degree in Computer Sciences and/or related work experience necessary.

Send resume with salary requirement to:

Employment Supervisor
United Telephone Company of Florida
P.O. Box 370
Ft. Myers, Florida 33902

An equal opportunity employer M/F

OPERATING SYSTEM DESIGNER

CRAY RESEARCH IS BUILDING THE COMPUTERS OF TOMORROW TODAY!

If you'd rather be working in an exciting environment of advanced computer technology, where innovation and foresight have created the world's largest and fastest scientific computers, talk to CRAY RESEARCH, INC., where the shape of the future is now.

We're looking for a far-sighted systems designer who will provide technical leadership and innovation in advanced operating systems concept and algorithm development in our Chippewa Falls, Wisc. facility. Individual will participate in research development and evaluation of advanced and future large-scale, high-speed computer systems from conceptual design to hardware implementation. Qualified candidates should have a related degree or advanced degree with 3-5 years experience, plus strong analytical capabilities.

With competitive salary, liberal fringe benefits and a unique profit sharing plan, all in a small company atmosphere, CRAY RESEARCH offers an outstanding working environment with true growth potential. For immediate and confidential consideration, please submit your resume including salary history to:

John Borchers
CRAY RESEARCH, INC.
Hwy 178 North
Chippewa Falls, WI 54729

An Equal Opportunity
Employer M/F

CRAY
RESEARCH, INC.

PROGRAMMER/ANALYSTS
SYSTEMS ANALYSTS

Air Products & Chemicals, Inc., a diversified, international gas and chemical manufacturing company with current annual sales over $1 billion has challenging openings for experienced professionals involving

- **Wide range of major business applications in financial, manufacturing, marketing and administrative areas**
- **Progressive, rapidly expanding organization**
- **Integration of programmer/analyst functions**
- **Extensive training and in-house education programs**
- **Excellent opportunities for advancement**

Positions available for both:
Programmer/Analysts
1-3 years experience
Systems Analysts/Project Leaders
3-5 years experience

The Management Information Department, located at our corporate headquarters in the Lehigh Valley of Pennsylvania, is now expanding its existing RJE teleprocessing network to include on-line applications and distributed processing using dfata based technology

We require:
- **Four year college degree or higher**
- **Demonstrated communications and problem solving abilities**
- **COBOL and OS JCL profeciency**
- **IDMS and CICS background a definite plus**

We offer:
- **Competitive salaries**
- **Medical and dental benefits**
- **Stock savings plan**
- **Tuition refund program**
- **Company paid relocation**

Please forward resume specifying educational and professional backgroiund in confidence to:

Mr. John R. Taylor, RHH, Employee Relations
Air Products & Chemicals. Inc.
P.O. Box 538, Allentown, PA 18105

Air Products

An Equal Opportunity Employer M/F

GROWTH AND OPPORTUNITY!

Florida Software Services Inc., located in Orlando, Florida is the world's leader in banking/financial applications.

Our history of growth is dynamic and reflects our ability to excel in the banking industry. Current business demands dictate further expansion. Expertise/proven ability in one of the following areas will qualify you for a career opportunity with us.

FACILITIES MANAGER (IBM/BURROUGHS)

Positions available throughout the United States. Total P/L responsibility requiring strong bottom line management to include hiring and training of personnel, marketing and systems operations. 3 to 5 years demonstrated success is a prerequisite.

SYSTEMS ENGINEERS (IBM/BURROUGHS/TRAVEL REQUIRED)

In depth hardware and operating software knowledge to include peripherals/configurations and terminal networks. Banking knowledge and experience would be a plus.

SALESMAN (STRONG CLOSERS)

Proven success in big ticket sales is a must. Software applications or D.P. sales will qualify you for this opportunity. Open ended earnings potential. Base salary plus draw against commission.

CUSTOMER SERVICE REPRESENTATIVES (TRAVEL REQUIRED)

2 to 3 years actual customer service experience handling customers in a one on one environment within the financial/banking industry.

PROGRAMMER ANALYST

2 years or more experience in financial applications utilizing COBOL in either IBM or Burroughs environment.

Many other positions will become available in the first quarter of 1980.

Send resume with salary requirements to:

FLORIDA SOFTWARE SERVICES INC.
TOM MARSH, MANAGER OF EMPLOYMENT
P.O. Box 2269
Orlando, Florida 32802

An Equal Opportunity Employer, M/F

SOFTWARE ENGINEER (CAD-CAM)

New Eng. shoreline oppty. for exp'd. computer aided design or mfg. pro. Also, jr. level situation for graduate math/geometry exp. & computer prog. To $25,000. (Fee Paid.) Contact Stan Durbas or Paul Meissner.

Robert Half of Hartford, Inc.
Agency
111 Pearl Street
Hartford. Conn. 06103
(203) 278-7170

SUNNY SOUTH!

$15,000 to $35,000

- Programmers & Analysts (Cobol, Bal, PL/1, Fortran)
- Systems Programmers (OS/ DOS)
- Burroughs, Honeywell, Minis

We give personalized service!
Fees paid by client companies.
Send your resume to:

SEARCH E.D.P., INC
13773 N. Centrl Expwy.
Suite 1305
Dallas, Texas 75243
Personnel Consultants

SENIOR SOFTWARE QUALITY ASSURANCE ANALYST

How would you like an opportunity to develop:
- ☐ **Technical Standards**
- ☐ **Testing Methodologies**
- ☐ **Application Development Aids**

Super Valu, the world's largest food wholesaler with over $3 billion in sales, seeks a DP professional with excellent communication skills plus 3-5 years systems development experience in a DB/DC environment. Proficiency in COBOL or PL1 is necessary.

This senior-level position affords rewarding challenges, and substantial compensation & benefits. For immediate confidential consideration, send your resume, including salary history to: **Dave Gelperin, Quality Assurance Manager, SUPER VALU STORES, INC., 101 Jefferson Avenue South, Hopkins, MN 55343.**

SUPER VALU ®

An Equal Opportunity Employer M/F

MARK IV

PROGRAMMERS & ANALYSTS

SRZ SOFTWARE SERVICES Inc., the largest and most experienced MARK IV consulting company in the USA, has openings for programmers and analysts familiar with design and development of MARK IV or MARK IV/IMS systems. We are looking for people for the following areas:

- **NEW YORK/NEW JERSEY/D.C.**
- **BOSTON/CONNECTICUT**
- **WEST COAST/MID WEST**
- **DALLAS/HOUSTON**

Our very competitive salaries are enhanced by bonuses, company paid medical, life & long term disability insurance, tuition refund, and a liberal expense policy. If you are interested in a career as a professional consultant please send a resume or call:

STEVEN R. ZEFF, PRESIDENT
SRZ SOFTWARE SERVICES, Inc.
61 North Maple Avenue
Ridgewood, N.J. 07450
(201) 444-9800
or
TONY LAMIA, VICE PRESIDENT
SRZ SOFTWARE SERVICES, INC.
50 West Hillcrest Drive
Thousand Oaks, California 91360
(805) 497-6975

DIRECTOR OF COMPUTER CENTER

SUNY DOWNSTATE MEDICAL CENTER

The Computer Center supports administrative and financial data processing at the Downstate Medical Center, including the medical college and a 350-bed teaching hospital with on-line Hospital Information System. Equipment currently includes IBM 370/145.

The Director supervises a staff of 40+ data processing personnel and an annual budget of $1.2 million. The Director is expected to provide leadership in the overall development and maintenance of data processing at the institution. Extensive reconfiguration of computing facilities is anticipated to meet expanded service and research needs.

Adequate technical background and managerial experience are required, preferably in both university and hospital milieu. The applicant should have demonstrated competence in systems development and project management and the ability to communicate and work effectively with others.

Send resume and salary requirements to:

Search Committee for Computer Center
State University of New York
Downstate Medical Center
Box 49-C, 450 Clarkson Avenue, Brooklyn, N.Y. 11203

Equal Opportunity/Affirmativa Action Employer

Programmers
Analyst/Programmer

EDP opanings for additional Programmars, Analyst/Programmers, and Analysts with expartise in ona or more of the following areas

Programmer — PL/1 experience with a good knowledge of COBOL.

Analyst/Programmer - Assembler (BAL) experience with good command of COBOL helpful for Large Burroughs System.

Work with IMS systems, programming and design. Coding done in COBOL and JCL.

Our IBM 370/158 under OS/VSI or MVS in an IBM Data Base environment is ready and sat to handla your challenging duties and responsibilities. Taka advantage within this financial institution of its growth, new equipment and highly advanced sophisticated workings.

Tha Federal Rasarve Bank (non-civil servica) is a central bank acting as a bank for banks, serving as the Government's bank It also supervises member banks and manages the Nation's money supply. The Bank offers compatitive salary & benefits

Send resume to:

The Personnel Department
Federal Reserve Bank of Cleveland
P.O. Box 6387
Cleveland, Ohio 44101

ADVANCEMENT OPPORTUNITIES

-LOCAL or NATIONWIDE-

Hundreds of openings . . ALL LEVELS . . . Systems Analysts, Programmers, Software Specialists, Data Base Specialists, Material Engineers, Technical Writers, DP Auditors, System 3 & 34 Managers, RPG/CICS Specialists, etc. with expertise in:

Systems Design & Development
Materials Management Systems
Scheduling & Production Control
Network Design & Control
Long-Range Planning
Data management
Software Packages
Data Processing Training
Information Systems
Financial & Accounting Systems
Scientific & Engineering Systems
Manufacturing Applications
Banking Applications
Insurance Applications
Hospital Applications
Retail & Wholesale Applications

NATIONWIDE — FEE PAID — CONFIDENTIAL

For more details, send your resume, or call us.

Mark Fuller
CADILLAC ASSOCIATES, INC.
32 W. Randolph St., Chicago, IL 60601
(312) 346-9400

SOFTWARE RESEARCH AND DEVELOPMENT

SYSTEM DEVELOPMENT CORP. HAS EMPLOYMENT OPPORTUNITIES FOR QUALIFIED AND EXPERIENCED

SYSTEM DESIGNERS - SYSTEM ANALYSTS SYSTEM PROGRAMMERS

THE COMPANY SDC has been the industry leader in Systems Software Development for over 20 years. We are undergoing expansion due to our demonstrated technical excellence.

THE ACTIVITY SDC/ISI is involved in the research, development and implementation of real-time Command Control and Communications systems for the U.S. Navy. These systems are for air, surface and underwater communications, weapons control, navigation and intelligence gathering. Our software professionals are using state-of-the-art techniques to build the systems of tomorrow.

THE LOCATION You will live and work in fabulous San Diego, California (East Coast opportunities also exist in our Fredericksburg, Virginia facility).

THE FUTURE Your opportunity is now! SDC offers top compensation and liberal fringe benefits including paid relocation. As one of our Software Professionals, you will enjoy our technically challenging but casual work environment. For consideration or information contact:

Employment Manager

SDC/Integrated Services Inc.

3065 Rosecrans Place, San Diego, Calif. 92110
(714) 223-2123

SYSTEM DEVELOPMENT CORPORATION

An Equal Opportunity Employer M F H

ROBERT HALF

FLORIDA

Sys Prog-370/MVS	22K
P/A-NCR Bnkg Cb1	17K
P/A-370/OS-CFO-Assem	27K
P/A-Harris-On Line	24K
Sys Prog-Burr-NDL	25K
Performance Analyst	22K
P/A-OS-Banking	20K
P/A-DOS/VS CICS Cobol	18K
Consultant- CPA firm	23K
P/A-CCP-Mfg & Fncl	17K
Software-RSIIM or D	18K
P/A-DOS/VS - Banking	15K
Manual Systems-Forms	18K
P/A-S&L-IBM or Burr	17K
Tech Wrter-2 yrs exp	18K
Hardware Anal-CMS	23K
DBA-370/OS/IMS	23K
Analyst-Mfg-MRP	23K
P/A-Personnel Sys	17K
Sys Prog-Any Mini	20K
Telecomm Specialist	22K
P/A-CICS-Assembler	18K
Sys Prog-HW-66 level	22K

Many others to choosa from. All faas and ralocation paid Mail rasuma to or call collect.

STAN ALLEN
ROBERT HALF
OF TAMPA, INC.
1311 N: Westshore Blvd.
Tampa, FL 33607
(813) 876-4191

FACULTY OPENINGS INFORMATION SYSTEMS

Information Systems Department — has a faculty opening starting Septembar 1, 1980. Assistant to Full Professor. Rank and class appointmant requiras an appropriata doctorate or ABD. Lactureship appointments require an appropriate master's degree. Both type appointmants require further qualifications which include a sincere interast in teaching and 3-5 years axparianca in either systems dasign, data base managemant, small business computers, or EDP auditing. Closing date for application is February 28, 1980. Equal Opportunity Employer. **Send resume to:**

Dr. David G. Foley, Acting Dean
School of Business Administration
California State Polytechnic
University, Pomona
3801 West Temple Avenue
Pomona, CA 91766.

SYSTEMS ANALYST PROGRAMMERS

Due to expansion, a major manufacturer located in Central Indiana has three (3) positions open for programmers in its Data Processing Department.

These positions offer an excellent starting salary (up to $21,000), liberal benefits, attractive working atmosphere, and excellent opportunities for advancement.

The ideal candidates will assist in developing and maintaining computer applications in marketing, accounting, support center, and manufacturing areas of the company. It will be necessary to program in COBOL. IMS Data Base and on-line training is desirable.

As an employee, you will work in a modern IBM 370/168 environment with OS/VS-1, VM, IMS and CMS for on-line program development.

If you would like to be considered for a position with challenge and advancement, send your resume and salary requirements in strict confidence to:

CW Box 2166
375 Cochituate Road, Rte. 30
Framingham, MA. 01701

SENIOR SYSTEMS ANALYST

We are a well-established, rapidly expanding manufacturing firm located in Northern Columbus. Our dramatic growth requires the addition of a Senior Systems Analyst to our Data Processing team.

You will participate in the design, development and implementation of a variety of medium scale computer systems. In this position, we seek a seasoned problem solver with 3-5 years systems development and 1-2 years programming experience.

We also require manufacturing systems experience and prefer some background in data base management systems.

We offer an attractive starting salary with outstanding fringe benefits, plus excellent growth potential. If you qualify we want to meet you. Send your resume with salary requirements in confidence to:

Liebert Corporation
Post Office Box 29186
Columbus, Ohio 43229

AT CRAY RESEARCH

We Build For The Future

At CRAY RESEARCH INC., we design, build, market and support super-scale computers used in scientific applications. We currently have outstanding opportunities for talented computer professionals.

SR. PROGRAMMER ANALYST

(On Customer Site)

Opportunities currently exist in many regions of the country. Duties include serving as a representative to large scale computer users, providing technical assistance and analyzing customer hardware and software requirements. This position requires a college degree in the scientific fields of Computer Science, Math, or Engineering or equivalent experience with an additional 3 plus years experience or advanced degree. OPERATING SYSTEMS and FORTRAN experience in a BATCH environment and the ability to communicate technical details to customers are essential. This position requires some travel.

We provide an orientation program in Minneapolis, Minn. These positions offer excellent growth opportunities, salary and company benefits. Send resume and salary history in confidence to:

C.W. Nelson
CRAY RESEARCH, INC.
1440 Northland Dr.
Mendota Heights, MN 55120
An Equal Opportunity Employer M/F

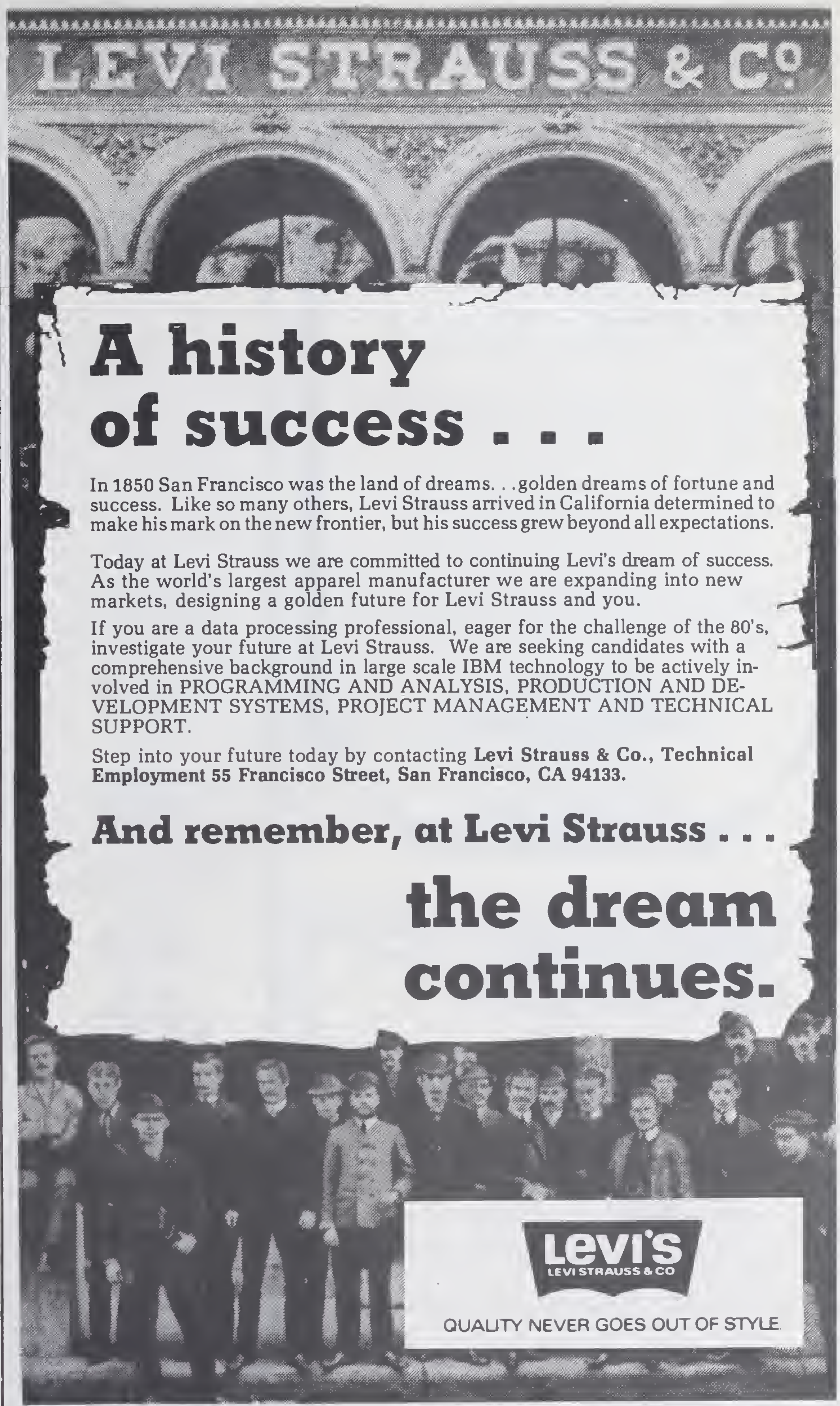
CRAY
RESEARCH, INC.

DIRECTOR OF INFORMATION SERVICES

We're totally restructuring our ultra-modern Data Center, complete with conversion from DOS to OS and additions to our current IBM 370/158 equipment. If you're the dynamic administrator we seek, it's your chance to assume conversion and expansion responsibilities now . . . and continue to direct data processing operations and programming functions. This top-notch position requires a take-charge professional with a strong technical background in applications for manufacturing, sales and marketing, as well as conversion experience.

The rewards match the responsibility. Salary range mid forties, plus bonus and comprehensive benefit package in a challenging atmosphere. We're a leader in our manufacturing industry, widely known and respected for superior quality and advancement opportunities in our Midwestern metropolitan headquarters. Please forward your resume in strict confidence to:

CW Box 2172
375 Cochituate Rd., Rte. 30
Framingham, Mass. 01701
An Equal Opportunity Employer M/F/H



A history of success . . .

In 1850 San Francisco was the land of dreams. . .golden dreams of fortune and success. Like so many others, Levi Strauss arrived in California determined to make his mark on the new frontier, but his success grew beyond all expectations.

Today at Levi Strauss we are committed to continuing Levi's dream of success. As the world's largest apparel manufacturer we are expanding into new markets, designing a golden future for Levi Strauss and you.

If you are a data processing professional, eager for the challenge of the 80's, investigate your future at Levi Strauss. We are seeking candidates with a comprehensive background in large scale IBM technology to be actively involved in PROGRAMMING AND ANALYSIS, PRODUCTION AND DEVELOPMENT SYSTEMS, PROJECT MANAGEMENT AND TECHNICAL SUPPORT.

Step into your future today by contacting **Levi Strauss & Co., Technical Employment 55 Francisco Street, San Francisco, CA 94133.**

And remember, at Levi Strauss . . .

the dream continues.

Levi's
LEVI STRAUSS & CO

QUALITY NEVER GOES OUT OF STYLE.

ATEX is a fast growing company founded to study selected problems of the publishing industry and solve them by developing high technology systems. In six years, our PDP-11 based system has become the benchmark of the graphic arts industry. This success is a result of a team effort by people who are the best in their professions.

ATEX has an above average benefits package providing company paid health and dental insurance, life insurance, long term disability insurance, 100% tuition reimbursement and ESOP (Employee Stock Ownership Plan).

ATEX SYSTEMS, INC. ... *This new subsidiary of Atex is developing text processing and composition systems for extremely large newspapers and publishing firms.*

SR. SOFTWARE DESIGNERS Design highly complex text processing systems. Individuals must be capable of making customer presentations. MS in Computer Science or equivalent is desired. For these positions, to ensure immediate consideration on your own behalf, send your resume to Stephen E. Pitt, Director of Employment.

SR. DIAGNOSTIC PROGRAMMER Develop systems level diagnostics on PDP-11 based systems. Credentials should include BSEE or equivalent, 2-5 years' minicomputer experience, and proven capability of project implementation (including documentation).

PROGRAMMER ANALYST
Develop and maintain software tools for the software design staff. Ideally, candidate should be able to thoroughly understand the design and use of Compilers, Linkers and Debuggers. Experience on PDP-11 assembly language is a plus.

SOFTWARE APPLICATIONS SPECIALISTS Install and support sophisticated text-editing systems in major U.S. cities. Test software, design software refinements and solve customer problems. Must work well in a customer environment. PDP-11 Assembly language is a plus.

To ensure immediate consideration on your own behalf, send your resume to Stephen E. Pitt, Director of Employment.

atex

15 Wiggins Avenue, Bedford, MA 01730 617/275-8300
An Equal Opportunity/Affirmative Action Employer

SR. PROGRAMMER/ ANALYST

The World of Advertising Needs You!

ADS, Advertising Data Systems, is currently developing a sophisticated Four Phase Minicomputer System to further serve our client companies in the advertising and entertainment industries. Between now and March, ADS will be looking for a few good people to help us maintain and exceed our leadership position.

Our parent company, IDC Services, in business since 1957, boasts an impressive $300 million in total sales. Offices are located in New York, Los Angeles, and Chicago and we're in the enviable position of being in a stable, inflation-proof business. These are some of the facts that offer the seasoned professional security, variety and advancement opportunities.

Qualified applicants will have a minimum of 3 years experience in COBOL, project leadership and systems analysis. Our salaries are excellent (in the top 20% of the EDP industry) as are the benefits. And you'll have a chance to use your skills in an exciting new environment. For immediate consideration, send resume to:

IDC
SERVICES INC
ADS
ADVERTISING DATA SYSTEMS

John Storto
ADS
303 E. Ohio
Chicago, IL 60611
equal opportunity employer m/f

COMPUTER PROFESSIONALS

Continued growth in Florida Computer Systems Company results in the following opportunities for qualified candidates:

PROGRAMMER ANALYST — One position requires strong financial systems background: prefer accounting degree. Other positions require experience in oil and gas exploration accounting and local government systems.

SYSTEMS ANALYST — Indepth knowledge of Clerk of the Courts function, including court record and scheduling, case histories, document indexing, etc.

TECHNICAL WRITERS — Experience in preparation of computer systems documentation, development of presentation material, maintenance of standards and procedures manual.

MARKETING REPRESENTATIVE — Dynamic individual to market application software packages in the local government sector. Requires minimum 2 years successful marketing experience in a computer related field.

We offer competitive salaries and excellent fringe benefits. Qualified candidates should submit resume with salary history to Employment Supervisor:

CONTINENTAL RESOURCES COMPANY
P.O. Box 44
Winter Park, FL 32790
Equal Opportunity Employer
Male/Female/Handicapped

THE PROS OF WORKING AND LIVING IN THE NEW SOUTH

- Growing business communities
- Attractive cost of living
- Warm climate

Our clients are all involved in major new projects utilizing the latest technology, and they offer exceptional promotional opportunities.

We are currently scheduling expense paid interviews during the next several months for ...

- Programmers
- Analysts
- Project Leaders
- Systems Programmers

Rush us your resume, or call us collect (station-to-station) at (713) 496-6100 and we will appraise your chances.

Scientific Placement, Inc.
Employment Service
P.O.Box 19949 - Dept 221
Houston, Texas 77024 (713) 496-6100

FLORIDA PROGRAMMER ANALYSTS

Tired of working for the vendor and tired of those cold vwinters? If the answer to this question is yes, then we are interested in exploring with you excellent career opportunities that are presently available with the Fort Lauderdale News/Sun Sentinel. We offer professional growth, competitive salary commensurate with experience and excellent fringe benefits. Successful candidate must have a minimum of two years experience. On-line programming preferred. Honeywell experience a plus. **Please send resume including salary history or for further information contact Claudia L. Jack, Employment Manager at 305-761-4386.**

Fort Lauderdale
NEWS/SUN SENTINEL
101 N. New River Dr. East
Fort Lauderdale, Fl. 33302
Equal Opportunity Employer

SYSTEMS PROGRAMMER EXCELLENT OPPORTUNITY IN MONTANA — BIG SKY COUNTRY

If you have 2-3 years experience in systems programming, with knowledge of MVS/VS1 internals, communications, VTAM, capacity planning, performance evaluation and CICS, we are interested in talking to you.

You will be involved in MVS, SNA conversion, hardware/software evaluation and planning. You will also act as consultant in providing technical support to user groups.

Interested parties please send resume to:

State of Montana
Department of Administration
Computer Services Division
Sam W. Mitchell Building
Helena, Montana 59601
Attn: Dennis Sheline
AN EQUAL OPPORTUNITY EMPLOYER

FLORIDA DP STAFFING

availABILITY, INC.

FLORIDA Average Temperature 75° No State Income Tax

With Temperatures Dropping as Winter sets in, FLORIDA Companies are stepping up their recruiting efforts. They recognize that Cold Weather makes some people think of Florida and they'd like to take this opportunity to get the best people available

Our clients will relocate your family to Sunny FLORIDA at no expense to you

If you are experienced in the areas listed below, send your resume to us immediately along with present salary

There may be Palm Trees around your Pool sooner than you think!

Multiple openings for the following exist throughout FLORIDA

BANKING PROGRAMMER ANALYSTS AND SYSTEMS ANALYSTS

Experienced with IBM, Burroughs, or NCR using COBOL or Assembler.

CREDIT CARD
TRUST
DEMAND DEPOSIT
ATM
SAVINGS
LOANS
MICR
CIF

LIFE INSURANCE PROGRAMMERS & ANALYSTS

Life Sftwr Pkg exp a must, IBM OS or DOS COBOL &/or Assembler **Salaries to $25K + Benefits!!**

DATA BASE DESIGNERS to $34K

IMS, IDMS, TOTAL

DP EDUCATOR/ TRAINER-$25K

Prefer exp with NCR Hdwr/Sftwr

SYSTEMS PROGRAMMERS DOS/VS, VSE, OS/ VS, MVS, IMS to $30K

Internals, Real Time Communication Processors, I/O Drivers, Etc ...

OPERATIONS MANAGER

Must be exp'd in managing a large scale 370/303X OS/MVS multishift operation with budgetary responsibility. Blue Chip Co. **Sal. to $27K**

COMMERCIAL PROGRAMMERS & ANALYSTS

Minimum of 1 Yr exp using IBM DOS or OS, Burroughs, or NCR Hardware and Cobol, BAL, PL/1 or NEAT/3. Pluses are VSAM, DL/1, CICS, IMS.

AVAILABILITY, INC.
813-872-2631
Dept-C. P.O. Box 25434
Tampa, Florida 33623

EDP SPECIALISTS

PROGRAMMER/SYSTEMS ANALYST, $18,000-$46,000. Opportunities from trainees to mgrs. New Jersey, Midlantic States & Nationwide. Live, Work & Play in areas of your choice, fishing, skiing, hiking, swimming, sailing, theatre, shore or mountain country. Plan your next career move. Contact Rusty Thayer, ARTHUR PERSONNEL, Suite F2, 8 Forest Ave., Caldwell, NJ 07006 (201/226-4555).

PROGRAMMER/SYSTEMS ANALYSTS, $18,000-$45,000. Have a great new year in New England! Send resume or call Dick collect at oldest employment service in Central NE (estab. 1946). LANE EMPLOYMENT, 405 Main Street, Worcester, MA 01608 (617/757-5678).

PROGRAMMER/SYSTEMS ANALYSTS, $16,000-$45,000. Choice positions available in Pennsylvania & national locations. We have been placing EDP personnel for 15 years. Reply in strict confidence to John Scheirer, WEIR PERSONNEL SERVICES, 535 Court St., Reading, PA 19603 (215/376-8486).

PROGRAMMER/SYSTEMS ANALYSTS NEEDED, $18K-$35K. Career opportunities await you in San Francisco Bay area or nationally. Call collect to John Hamilton or Gail Wolfslau, SUN VALLEY AGENCY, 190 N. Wiget Lane, Walnut Creek, CA 94598 (415/933-0100).

npc NATIONAL PERSONNEL CONSULTANTS

Programmer/ Analysts

The World's largest manufacturer of structural honeycomb materials is also a diversified, high-technology corporation that is experiencing record growth. We are seeking programmers who can address this growth using a distributed DP environment and Datapoint equipment with both on-line and batch processing capabilities.

Three key locations require hands-on programmers with experience in COBOL or DATABUS and who can successfully coordinate with our systems team. Our programmers prefer the challenge of problem solving and enjoy the satisfaction of delivering workable programs that can accomodate rapid growth and handle diversification.

Available positions are located in resort or suburban communities near metropolitan centers:

Texas

Manufacturing plant near Dallas requires 2+ years' of experience in COBOL or related languages including design and documentation using manufacturing applications. Programmer will take part in systemization of the plant.

Arizona

Large plant near Phoenix requires a BSIE or equivalent with 2+ years' of programming experience, COBOL and a well rounded understanding of design and implementation of programs using manufacturing applications.

California

This job is located at our administrative headquarters near San Francisco. Two or more years' of programming experience in financial applications including Payroll, A/R, A/P and G/L, a college degree or equivalent experience is required.

If you have the right qualifications, then we'd like to talk with you about opportunties with Hexcel. We offer paid relocation and a competitive salary and benefits package.

Please send a resume, including current compensation to N. Frensley, Hexcel Corporation, 11711 Dublin-Blvd., Dublin, CA 94530. An equal opportunity employer.

HEXCEL

Faculty Position:

Applications invited for Computer Science tenure-track faculty position. Masters in Computer Science required; Ph.D. preferred. Salary range $16,000 - $20,000. Teach undergraduate courses in DMS, Data Structures, and Numerical Analysis. Starting date August 15, 1980. Application closing date February 15, 1980. Send resume to: **Computer Science Department, University of North Dakota, Grand Forks, ND 58202.**

(An Affirmative Action/
Equal Opportunity Employer.)

EDP INSTRUCTOR

FULL-TIME POSITION
TO $25,000+

A unique opportunity with a fast growing non-degree EDP training program. Move into a professional environment developing and presenting state-of-the-art analysis and programming courses. Extra compensation for teaching over normal course load. Full benefits and 22 vacation days a year.
Contact Robert F. Bahnsen at: 203-549-3600 Ext. 217

SEND RESUME TO
PERSONNEL DEPARTMENT
THE HARTFORD GRADUATE CENTER
275 Windsor St., Hartford, Ct 06120
An Equal Opportunity Employer

PACIFIC NORTHWEST Seattle-Portland

What recession? Our booming companies need DP people. Mild climate offers year-round sailing. Skiing 1 hour away. Come join the good life!

Mini consult, MBA	**$30,000**
Sr Analyst	**24,000**
Anal/prog CICS	**25,000**
Sys Anal, 3+ yrs	**21,500**
Database sys/anal	**26,000**
Prog/anal, COBOL, 2+ yrs	**$18-22,000**

Call collect 206-453-0444
Computer Personnel & Consultants, Inc.
1 Lk Bellevue Dr.
Bellevue, Wa 98005

SOFTWARE/PROGRAMMERS

40K

If you are not making 40K you are not realizing your full potential. We have many positions in N.Y., N.J., and Conn. Note that we are not an Agency. Rush resume to **ALPHA, 270 Henderson St., Suite 18-H, Jersey City, N.J. 07302. (201) 451-3432.**

COLORADO SKI COUNTRY!

Excellent career opportunities in the following disciplines:

- **Distribution Management Systems**
- **Data Base/Data Communications**
- **Real Time Control Systems**
- **Systems Management**

Reply in confidence to:
TSC, Inc.
2755 So. Locust, Ste. 210
Denver, CO 80222
(303) 758-5285

MONTEREY, CALIFORNIA PROGRAMMER ANALYST

Responsible for design and development of municipal data processing applications $17,880-$21,744/yr, plus excellent benefits. City application w/resume required. **Apply Personnel Office, City Hall, Monterey, CA 93940; (408) 646-3766.** App deadline 2/1/80.

Computer

We Have Room For Your Innovation And Imagination!

National's Systems Division produces a broad range of Point of Sale systems for the retail food industry. Over the past 7 years we have achieved a steady high growth rate which has positioned us as one of the industry's leaders. We are a vertically integrated division with technical scope that encompasses user application, intelligent terminals, transaction oriented operating systems, higher level language systems, proprietary fail safe minicomputer systems, data communications and laser scanners. This is a mature systems development organization which is an integral part of an extremely successful semiconductor company. This is an exciting time to join us as we develop concepts for the design of software and hardware architecture for our next generation of products.

Operating Systems Designers

We have an immediate need for a few individuals with significant experience in the design and implementation of minicomputer operating systems. These individuals will join a small group of professionals in the development of a new software based for current and future products. The operating systems design will be fully integrated with the development of the next generation hardware. Successful candidates will be well versed in:

- data management and access methods
- job and process management
- data communications
- memory management
- I/O device control
- Block structured languages

Microprogrammers

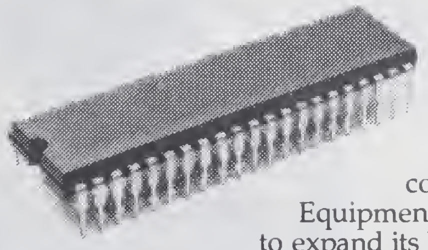
Our new hardware architecture includes a horizontally microprogrammed control processor. Initial development projects include Pascal interpretor, COBOL interpretor, and operating systems assists. We seek experienced microprogram designers; familiarity with the 2900 family of Bit slices is a plus. A BS/MS in EE or CS is desired.

National offers exceptional salaries and benefits in a stimulating environment. For confidential consideration, please call **Jim Rook COLLECT** at **(408) 737-5255**, or send your resume to his attention at **National Semiconductor, 1090 Kifer Road, Sunnyvale, California 94086.** We are an equal opportunity employer m/f/h.

National Semiconductor

Catch The Spirit!

LSI/MIS Professionals



As the world's leading producer of interactive computer systems, Digital Equipment Corporation continues to expand its LSI manufacturing businesses for our computers. Our newly constructed facility in Hudson, Mass., has an opening for an LSI/MIS Manager. This individual will define the business systems requirements for the semiconductor manufacturing facility, and manage systems support projects to provide management information for the control of work-in-process line. Application projects will primarily include areas of production control and process control systems.

Candidates must have a BA/BS or equivalent with at least three years experience in semiconductor sytems development/implementation, project management and commercial applications, plus strong written and verbal skills. This position will require the ability to communicate with all levels of LSI management; including materials, finance, manufacturing and process engineering. An MBA is desired; experience with Digital's computer systems and COBOL is helpful.

If you are interested and qualified, please forward your resume to: Richard Kisiel, Digital Equipment Corp., MO/P53, Dept. G807 3114, 274 Cedar Hill Road, Marlboro, MA 01752, or call COLLECT (617) 481-9511, ext. 6400. We are an equal opportunity employer m/f.

digital

SUPERVISORY COMPUTER SYSTEMS ANALYST

The National Institutes of Health, Public Health Service, National Library of Medicine has one career Civil Service position open for a Supervisory Computer Systems Analyst. This position is for the supervisor of a branch of programmer/analysts that provides software development, maintenance and services to support library information projects, with emphasis on information retrieval and library technical services processing. Salary range from $34,713 to $40,498 per annum.

The candidate must have:

- Leadership skills which demonstrate the ability to guide all aspects of the development and management of significant and complex information systems.
- Analytical and communication skills which demonstrate the ability to plan and organize information system projects and to prepare highly technical oral and written presentations for management.
- Technical skills in several areas of current computer technology, such as DBMS, information retrieval, on-line systems, communication systems or distributed processing systems.

Please send SF-171 (Personal Qualifications Statement) by February 4, 1980 to: Yvonne C. Reid, NATIONAL LIBRARY OF MEDICINE, 8600 Rockville Pike, Bethesda, MD 20209. Equal Opportunity Employer.

NATIONAL INSTITUTES OF HEALTH

PHILADELPHIA

ASSOCIATE MIS DIRECTOR TO 32K

Pretigious PHILADELPHIA health care institution requires programming, analysis, and project management background, experience with data base and systems concepts to manage development staff. Hospital background helpful.

For full details of any of our FEE PAID positions, please call for immediate interview appointment or forward resume to our Recruitment Specialist Completely Confidential

ROBERT HALF
OF PHILADELPHIA, INC.
2000 Market St., Suite 706
Philadelphia, PA 19103
(215) 568-4580

SENIOR LEVEL EDP CONSULTANT

Our midwest professional services firm is searching for outstanding individuals to grow with our information processing consulting practice.

As an independent firm, we serve our clients' senior management with counsel and technical assistence, but we do not provide software or hardware or have relationships with those that do.

A "law office" atmosphere, extremely challenging assignments, little travel, an excellent compensation plan including bonus and participation, and an assigned car for business use await the professionals who will be selected.

We require5-10 years of significant experience, a high degree of self reliance, an excellent education and the carrier skills that make consultants successful. Specializations sought are:

- -Project manager for large DB/DC projects.
- -Manufacturing systems analyst.
- -Master planning specialist.
- -CPA for EDP auditing and systems assurence reviews.

Please describe your career history, education and goals and interests in a letter to me if you are interested. I will contact you within the month if we appear to have a potential match. **Address your letter: Confidential: Office of the President, c/o CW Box 2150, 375 Cochituate Rd., Framingham, MA 01701**

An Equal Opportunity Employer M/F

DP PROFESSIONALS

IMMEDIATE OPPORTUNITIES IN MIAMI, FLORIDA

The Dade County Public School System has openings at its Computer Center, located in the S.W. area near FIU. An ITEL AS 6-2 (IBM 3032 Equivalent) uses MVS-SE & TSO. Applications are programmed using command level of CICS, COBOL, EASYTRIEVE & MARK IV. The Data Base management system is ADABAS.

SR. CICS ANALYST/PROGRAMMERS

salary range: $21,431 to $28,932. Heavy programming experience in BAL and/or Macro Level CICS required. Systems design and data base experience a plus! New openings offer excellent opportunities to qualified individuals.

SYSTEMS & PROGRAMMING SUPERVISOR

starting salary: $21,431. Must be experienced in the supervision of all levels of programming personnel, systems design, preparation of management reports, OS JCL and COBOL.

Benefits include up to 5 weeks vacation depending on time with company, 12 paid holidays, 12 days sick leave, insurance package (medical, dental, vision and life) and a pleasant working environment. Please send detailed resume of education, experience and salary by FEBRUARY 1, 1980 to:

Dr. G. L. Gilyard
Director, Administrative Services
DADE COUNTY PUBLIC SCHOOLS MIS
1410 N.E. 2nd Avenue, Room 100
Miami, FL 33132

Equal Opportunity Employer M/F

IMS - CICS PROFESSIONALS
SUNBELT and WEST COAST OPENINGS

Cutler-Williams, Incorporated provides a wide range of information processing services including Systems Analysis, Software Design, Facilities Management and Project Management. During the past decade we have built a customer base of "Fortune 500" Companies and a talented Professional Staff.

We are currently seeking Business Professionals whose background include one of the following:

- **IMS DB, IMS DB/DC Applications Experience**
- **CICS MACRO and Command Level Experience**

Cutler-Williams, Incorporated provides an excellent package of major league benefits which include paid medical, dental, disability and life insurance coverage. We offer an excellent compensation plan which includes a salary plus overtime compensation as well as a written production bonus plan payable semiannually. This is an excellent opportunity to accelerate your career growth by joining a young, but well-established organization.

To find out more about Cutler-Williams and the current openings, call our toll free number either day or evening in Dallas at 1-800-527-4907 or send your resume to:

CW
PRIDE IN PERFORMANCE

CUTLER-WILLIAMS, INCORPORATED
Attn: Rich Brzozy
2655 Villa Creek Dr., Suite 205
Dallas, Texas 75234
1-800-527-4907
(214-243-3421 in Texas)

An Equal Opportunity Employer M/F

PROGRAMMING MANAGER

A major S.E. Michigan firm currently has an opening for a Manager of Programming and Software Production. To qualify, you should:

* Be throughly familiar with the development of software to meet customer specifications.

* Have a background in real time process control or scientific applications.

* Have three to five years in a managerial position, preferably as a second-level manager.

This is a significant opportunity for the right person to take over a large programming department and make a major contribution to corporate growth. Respond in confidence:

CW Box 2157
375 Cochituate Rd.
Framingham, MA 01701

DATA PROCESSING PROFESSIONALS

We are a growing financial institution and we are devetoping a major IBM 4300 on-line system. We are expanding our DP staff in two areas:

SENIOR PROGRAMMER/ ANALYST:

CICS, DL/I, DOS/VS
Experience Required

DP MANAGER:

CICS, DL/I, DOS/VS
Experience Desirabte

Send resume and salary history to:
Mr. Peter Staley, IBM Westchester
Employees Federal Credit Union
600 Midtand Avenue
Rye, New York 10580

ROBERT HALF

NEW ORLEANS OPENINGS

P/A Cobol/Neat 3	$25K
S/A Bus appl	$26K
PROGRAMMER Assembler	$20K
PROGRAMMER Cobol/Sys 32	$20K
PROG TRAINEE Cobol	$16K
TECH ANALYST Sys prog exp	$28K
PROJ MGR 5 yrs DP exp	$30K
SR. ANALYST IMS exp	$25K
SYS PROG — S.E. type work	$30K
SCIENTIFIC — Fortran	$25K
TECH SUPPORT — Univac-Cobol	$2JK
SYS PROG — IMS/CICS/NCP	$20K
P/A — DEC/PDP/RSTS	$25K
TECH MGR — IMS/TSO	$27K
REAL TIME ANALYST Minis	$24K
APPL ANALYST TSX-11M	$26K
PROGRAMMER — Neet 3/reteil.	$18K

Other locel & nat'l pos. eveileble
Client firms pey ell fees

JERRE BROWN
ROBERT HALF
OF LOUISIANA, INC.
135 St. Charles Ave. #1020
New Orleans, LA 70130
(504) 524-3773

CALIFORNIA

If you are interested in relocating to CALIFORNIA, call the West Coast's largest firm devoted exclusively to employment services for the Computer Professional. Our staff is composed of former DP Managers and Software Specialists, well-equipped to understand your special needs.

You may call us collect.

PROGRAMMER/ ANALYST to $25K

Redevelopment of Aircraft Maintenance Scheduling System. Multiple 370 MVS CICS COBOL environment. Heavy user contact. Airline employee privileges. Fully paid interviewing and relocation expenses.
Ask for Large Systems.

PROGRAMMER to $22K

Call us if you have two years FORTRAN, BASIC, PASCAL, or ALGOL experience and would like to be involved in a mini tumkey environment.
Ask for Business Systems.

COMPUTER CAREERS
INC . AGENCY

280 Atlantic Avenue
Long Beach, CA 90802
(213) 437-2881

EDP OPPORTUNITIES

NEW YORK CITY	
MGR VOICE & D: ta Commun	$35K
SYSTEMS ANAL quotron800 Deta nets	$25K
FINCL SYSTEMS ANAL MBA & Fortran	$30K+
SYST ANAL V 370 OS VS CNS PLI	$31K
ASST PS MGR DOS VS CiCS	$31-33K
MGR Software DOS/VS CICS capacity plan	$38K
PROG ANAL On-Line CICS	$25K
BASIC FORTRAN deg	$25K
OPERATNS DC Mgr DEC 1020 staff 25	$35K
PROJ LDR On-Line mini maxi bankg MBA	$40K
CORP Fince NBA Fortran Basic	$25-29K
SOFTWARE DOS GRASP	$31K
MICROprocessors Intel Motorola etc.	$33K
PROJ LDR-Some trading support	$33-35K
NEW JERSEY	
VOICE & Data commun line modems	$30K+
INIX IMS VS network control	$35K+
SCIENTIFIC pharmaceutical Fortran Basic MS	$30K
SOFTWARE TSO ALP SAS JES2 VSAM	$35K
BIG Syst mgmt mktg MBA	$38K
SOFTWARE MVS JES2 network	$33K
MGR Software DOS VS CICS	$35K
MGR P&S DOS VS CICS	$43K
PROG SYST 3 15D RPG II	$Open
LONG ISLAND	
DATA Center Mgr deg IBM mini on line	$40K
VOICE & DATA Mgr	$35K
SOFTWARE MGR	$45K
SOFTWARE DOS GRASP ICL BAL	$30K
TECH WRITERS micro processor based visual	$30K
EDP AUDITOR operational syst rev	$21-25K
IMS DB Design analyst MVS 3033	$31K
SIMULATION ANAL Microprocessor	$32K
PROG Mgr ALP COBOL communications	$35K
CONNECTICUT	
S/A realtime mini medical epplic physics SE ALP	$32K
PROG ANAL COBOL OS MVS	$25-28K
PROG ANALY APL RAMIS Fortran	$27-29K
PROG ANAL IMS DC OS MVS	$25-29K
SOFTWARE OS VS MVS VM	$31-33K
PROG ANA' VM CMS	$27K
RELOCATE	
S/A degree inventory supplies engrg	$35K
MKTG Specielist word process comm	$30K
PROD MGR Word process sls mktg exp domestic intl travel	$30K
MKTG SPECIALIST Hardware & Soft field support etc	$30K
TRAINING Mktg word process 50% tvl	$31K
INDUSTRY MKTG ANAL BS & select mkts	$31K
TELECOMMUN Support specialist ASYNC & BISYNC 35% trvl	$35K
PROJ LDR Interactive basic PLI COBOL	$35K
DIAGNOSTICS PA VM CPU peripherel	$35K
OS proj ldr systems aid min micro PLI Z80 8080	$40K

Call Bill Borrelli (212) 349-3610

WM HARRIS ASSOC
150 Broedway Agency New York, NY 10038

A COMPANY KNOWN FOR THE PEOPLE IT KEEPS.

In only ten years we have become a recognized world leader in the development and application of new systems and software technology. Serving both major mutli-national corporations and U.S. Government agencies, we have built a reputation for excellence.

COMPILER DEVELOPMENT

SofTech is developing compilers for state-of-the-art programming languages with features such as abstract data types, exception handling, parallel processing, and support for large systems development. In addition, we are using advanced global, machine independent and target specific optimization techniques to produce highly efficient compilers that can easily be retargeted and rehosted for new processors. SofTech is developing such compilers in host environments that include the IBM 370, DEC 10, HIS 6180, PDP 11/70 and VAX 11/780, Interdata 8/32 and CDC 6600.

We are seeking experienced compiler designers as well as other system software specialists with credentials in the areas of linkers, loaders, assemblers, and database product development. If you're a talented software professional seeking the high visibility of an expanding company where individual contribution counts, we're the ones to talk to. Experience with Government standards for project development and documentation requirements would be particularly useful. Our continuing growth has created some excellent opportunities in the Waltham, MA area.

DIGITAL COMMUNICATION SOFTWARE

MEET THE CHALLENGE
OF THE '80s AT SOFTECH.
WE WILL BE CONDUCTING LOCAL INTERVIEWS.

There are several openings for individuals with 2-8 years' experience in FORTRAN and Assembly Language. Familiarity and experience in the areas of digital communications, software and signal-processing is required. Experience in minicomputers and micro processors is also desirable. These positions require ability to relocate to Nutley, NJ or Newport, RI.

We offer highly competitive salaries and an outstanding benefits package. If you are a talented professional ready to move into an environment where your contribution will be recognized and rewarded, please investigate these opportunities.

For additional information, please contact Judith C. Forsythe, Collect at (617) 890-6900, or send your resume to her at SofTech, Inc., 460 Totten Pond Road, Waltham, MA 02154.

en effirmetive action, aqual opportunity amployer

SOFTECH
THE SOFTWARE TECHNOLOGY COMPANY

CLASSIFIED ADVERTISING ORDER FORM

Computerworld's Classifieds work.

Issue Date: Ad closing is every Friday, 10 days prior to issue date.

Sections: Please be sure to specify the section you want: Time and Services, Software for Sale, Position Announcements and Buy/Sell/Swap. (Available upon request: Software Wanted, Turnkey Systems and Real Estate.)

Copy: We'll typeset your ad at no extra charge. Please attach CLEAN typewritten copy. Figure about 25 words to a column inch, not including headlines.

Cost: Our rates are $73.50 per column inch. (A column is 2″ wide.) Minimum size is two column inches (2″ wide by 2″ deep) and costs $147.00 per insertion. Extra space is available in half-inch increments and costs $36.75. Box numbers are $10.00 extra.

Billing: If you're a first-time advertiser, (or if you have not established an account with us), WE MUST HAVE YOUR PAYMENT IN ADVANCE.

Ad size desired: _____ columns wide by _____ inches deep.

Issue Date(s): ____________________

Section: ____________________

Signature: ____________________

Name: ____________________

Company: ____________ Title: ____________

Address: ____________________

____

Telephone: ____________________

Send this form to:
CLASSIFIED ADVERTISING, COMPUTERWORLD
375 Cochituate Road, Route 30, Framingham, MA 01701

ADP PROFESSIONALS

GAI, a well established international computer consulting and software company is expanding its professional staff in CALIFORNIA, ARIZONA, and the WASHINGTON, DC areas. We offer a challenging environment, unlimited growth opportunities, excellent salaries and an outstanding benefits package. Interviews for immediate CAREER OPPORTUNITIES are being conducted for:

CALIFORNIA, HERE I COME

- Join our staff in sunny southern California (near L.A.), on major system development work. Min qual: 4 yrs COBOL and exp with IDS-II, DM-IV, TDS (TP), on H-6000/L66 computers.

GCOS TO PHOENIX, ARIZONA

- If you have an earnest desire to work in the enhancement and futuristics of GCOS Systems Software, our staff in Phoenix is for you. We offer the opportunity to work on the redesign of Honeywell Large-scale operating system, GCOS-8. Min qual: 2 yrs GMAP/GCOS exp with good knowledge of GCOS III OS.

WASHINGTON, D.C.

- In the Nation's Capital, our staff is located next to a METRO stop. Here we have a full slate of challenging and diversified projects. Min qual: Prog.—2 yrs COBOL exp on any large-scale main frame. Prog/Anal—Min 5 yrs COBOL with 2 yrs of analysis, design, and implementation work.

If you have the experience and are an ambitious DP professional, do yourself a favor and give us a call. You'll find, we not only use the latest state-of-the-art techniques—but that GAI is TECHNOLOGY.

Call or send resume to:

GAI

1815 North Fort Myer Drive Arlington VA 22209
ATTN Director of Personnel (703) 525-9292
Equal Opportunity Employer

SYSTEMS PROGRAMMER

$26-$32,000

A Fortuna 50 Compeny with assets in excess of 4 Billion dollars is currently seeking severel systems programmers for thair NEW Data Processing Technical Services Centar The hardwara will consist of twin 3033's end two 370/168's. Software consists of MVS, JES 2, CICS , SNA, NCP, 3704's end 3705's communications controller Requirements ara e minimum of 1 yaer experienca in either opereting systems generation or telacommunications installetion. A good knowledge of BAL is required and e knowladge of any other lenguage is e plus. The company offers the following outstanding benefit peckaga: full BS/BC, Mej Med, flaxibla hours, free prescriptions, free dental end extensive profit sharing and sevings plen. There ere elso 2 merit reviews in first yeer This company will ba conducting intarviews in our office on eny convenient evening during the week For immadiete consideretion and interview pleese cell: Bill Cooke. Or send rasuma to:

CENTRAL EDP
201-994-4730
513 W. Mt.Pleasant Ave **Livingston, NJ 07039**

Programmer Analyst

An excellent opportunity exists in the application area of our Corporate Systems Department. We are looking for a highly motivated person with at least three years of COBOL experience. Experience with Assembler, DBOMP, DL1 or CICS is an added plus, but not required. We are a DOS shop whose operations include both Batch partitions and On-Line partitions using CICS. If you want to join a progressive leader in the housewares industry, send your resume and salary requirements in complete confidence to:

MIRRO

G.R. Benzschawel
MIRRO Corporation
P.O. Box 409
Manitowac, WI 54220

An equal opportunity employer M/F

SYSTEMS ANALYST

Alaske's largast financial institution hes en excallent opportunity for e Systams Analyst with IBM 370 experience. The position raquires a minimum of 2 yaers' systams enalysis experianca on major systems with top-down design and other current techniques. Strong ANSI COBOL and IBM 370 OS JCL is a must. Banking background and interactive axperience is desirable.

We offer superior career opportunities with competitive saleries and an outstanding benefits package which includes medical, dental, vision, and profit sharing.

Please send resume including salery history to: **V.F. Garvey, Personnel Director, National Bank of Alaaka, P.O.Box 600, Anchorage, Alaaka 99510.** An equal opportunity employer, m/f.

NBA

NATIONAL
Bank of Alaska

TECHNICAL WRITERS AND INSTRUCTORS

To $27 K

As a member of the STC, I have en understending of tha necessity for a good writing and leeching environment. Clients especielly from tha New England aree heve asked me to find them quelified writers and instructors

Partial Liating:

HARDWARE PUBS —

1) Senior, junior end entry leval positions axist for people with digitel experianca in maintenanca end repair TECHS, F/E's end EE's may qualify
2) Sanior herdware WRITER with micro-procassor and digitel experiance for process control computer systems.

SOFTWARE PUBS —

1) For soltwere customer documentation lor process control computer systems including promo materials end herdcore menuals
2) All ereas from ops and user to Operating Sysiams. IBM Protocols and RJE would ba e+

TECHNICAL INSTRUCTORS

Hardwere and software positions exist for INSTRUCTORS and COURSE DEVELOPERS on various computer products If you're a TECH, FE or PROGRAMMER, you may lika the platform It's a great way to gain diversified equipment experience.

Contact Jack Gilbert at:

JUDGE ELECTRONICS, INC.
Suite 100
2 Newton Executive Park
Newton Lower Falla, MA 02162
Call Collect 617-965-9700

Executive Search & Placement

TEXAS

Several career opportunities exist for DP professionals in the nation's soundest economic and lowest cost-of-living state Heavy needs for IMS CICS database and enelysts and programmers plus

- **CICS Prog/Anala COBOL/ALC**
- **OS COBOL Programmera**
- **Banking, Credit Card Applicationa**
- **DP/Prog. Managera**
- **IMS COBOL, Prog/Anala**
- **Scientific Programmera**
- **Mini-Computer Specialiata**

These positions are in Dallas WE SPECIALIZE IN DATABASE PLACEMENTS NATIONALLY AND ALL D P TYPES FOR TEXAS AND SOUTHERN REGION Some are exclusive openings immediately available and employers gearing up for year-end and first quarter hiring Timing is the key. so call us or forwared resume ASAP!

COMPUTER LOGIC, INC.

2829 W. NW. Highway
Suite 207
Dallas, Texas 75222
(214) 350-7750

equal opportunity employer m/f

COMPUTER GRAPHICS

Terak is a young, rapidly growing Arizona based corporation, located within the Phoenix metropolitan area. You will not only experience the opportunities Terak has to offer: you will be able to experience the beautiful Southwest.

Our cost effective graphics computer systems are gaining national recognition in both the educational and industrial communities. We are currently seeking motivated, experienced engineers to contribute in the definition, design and development of our next generation of graphics computer systems.

Professional software engineering opportunities are available in support of this development effort. A BSEE, BS Computer Science or equivalent degree with three years experience is required. Working experience with minicomputer systems, particularly RT-11 or RSX-11 on PDP-11 or LSI-11 equipment is desirable. Working knowledge of Assembler, Fortran, Basic and Pascal is beneficial. Opportunities exist for individuals with one or more of the following specific areas of expertise:

- **I/O PROGRAMMING & REAL TIME PROCESSING SOFTWARE DEVELOPMENT**
- **OPERATING SYSTEM INHANCEMENT & DEVELOPMENT**
- **GRAPHICS SOFTWARE DEVELOPMENT & SUPPORT**

If you are interested in growing with Terak in the exciting field of graphics computer technology, please submit your resume, including salary history, in confidence ot Susan Tellier, Personnel Director:

TERAK CORPORATION
14405 North Scottsdale Road
Scottsdale, Arizona 85254
902/991-1580

Tarka is an equal opportunity/affirmativa action employer m/f/h/v

terak
CORPORATION

DATA ADMINISTRATOR

Looking for High Job Satisfaction?

A large privete non-profit community based organization providing job training and placement services to the poor and long term unemployed, needs help with implementation end management of our complex business end student file epplications using a new DEC 11/70 RSX-11M system and e new fully relational DBMS product called Oracle

Minimum five years related experience required. Salary ranga to $30,000; excellent fringe benefits. Send resume and salary requirements to:

Personnel Director
Center for Employment Training
425 South Market Street
San Jose, California 95113

An equal opportunity employer.

DIRECTOR OF MFG. SYSTEMS HARDWARE

$55-60K **FEE PAID**

Highly successful, fast-growing systems herdware manufacturer seeks dynamic individual for Director of Manufacturing. Selected candidate will have BS/MS EE or equivalent technical degree, 10 years minimum systems hardware manufacturing beckground with MBA highly desirable. Individual will report to VP and have total responsibility for production, manufacturing engineering, test, refurbishment and training activities. This challenging cereer opportunity is highlighted by excellent corporate visability, outstanding compensetion/benefit package with rapid upper mobility. If you are an aggressive, decisive, motivated manufacturing executive seeking a real challenge, call or send resume in confidence to:

Phil Kapp,
Key Search,
302 1st Bank & Trust Bldg.,
Richardson, TX 75080,
(214) 235-8371.

Accelerated growth and promotions has created an immediate need and ground floor opportunity in SOUTHERN CALIFORNIA'S most populer food processing company. We use "Stete of the Art" NCR Herdware.

Come to the SUNSHINE, SURF and TEPID climate to work as

SR. PROGRAMMER ANALYSTS & PROGRAMMER ANALYSTS

Minimum 2 to 5 years experience with COBOL a must. **Ability to interface with users.** On-line business applications experience beneficial. EXCELLENT BENEFITS include: FREE PARKING, Company paid medical, dentel, vision, prescription, pension, life and educational programs. If you want to ectively contribute to our fast growing company, send resuma end salery history to:

Knudsen
CORPORATION

P.O. BOX 2336 Terminal Annex
Los Angeles, CA. 90051
Attn: Mr. O.E. Blake

Equal Opportuity Employer.

HELP!!

One of our top clients with data centers in Florida, Colorado, and Maryland, seeks Programmers, Programmer/Analysts and Systems Analysts to function as consultants to their national and international clients. The following are mandatory requirements:

1) ANS COBOL
2) MANUFACTURING EXPERIENCE IN AN IBM OR HEWLETT PACKARD ENVIRONMENT
3) WILLING TO TRAVEL EXTENSIVELY

The company pays all fees, including interviewing and relocation, additionally, they offer excellent benefits, in-house career progression and salaries in the $17-30K range. Please call me collect (904) 398-7371 if you are interested in this excellent opportunity.

BILL DENNY
VICE PRESIDENT
Jim King and Associates

438 Gulf Life Tower/Jacksonville, Florida 32207
(904) 398-7371

COMPUTER MAINTENANCE TECHNICIANS

Amoco Production Company needs experienced Computer Maintenance Technicians to service and repair computer systems. Previous experience on Interdata or Raytheon systems preferred; experience on any computer system will be considered. Job opportunities exist in
New Orleans

Qualified applicants may call collect: (504) 586-6241 or send your resume to:

Raymond J. Russell
Amoco Production Company
P.O. Box 50679
New Orleans, La. 70150

AMOCO

AMOCO PRODUCTION COMPANY
An Equal Opportunity Employer

WACKER SILTRONIC CORPORATION

Systems Analyst

Wacker Siltronic Corporation is part of a multinational company with a broad spectrum of chemical-based products. Founded in 1914 in Germany, Wacker has become a leading producer of hyper-pure silicon wafers. Portland is now the base for this process. Because our product plays such an integral role in electronics and computer technology, we anticipate a steady growth rate. Your career can grow along with our company, if you are qualified to work in the organization we are building.

Working within a distributed IBM 370/S100 DOS environment, assume responsibility for system design, programming and large project development in support of manufacturing application systems and accounting systems. Programming will be done in COBOL and PL/1. On-line experience necessary.

If you are qualified please send your resume to: **Mary Walhood, Department W109, 200 S.W. Market Street, Suite 1130, Portland, Oregon 97201, (503) 243-2020.**

An Equal Opportunity Employer

WACKER

WACKER SILTRONIC CORPORATION

COMPUTER SCIENCE FACULTY POSITION

The Department of Mathematics and Computer Science, University of Denver, expects to add a tenure track position in computer science, Fall, 1980. Applications are now invited for this position at the assistant professor level. Applicants should hold or be completing a Ph.D. degree in computer science or a related field and should have demonstrated a potential for research and fruitful interaction with faculty. A special interest in teaching courses in systems programming and computer architecture would be helpful. Letters of application, including a current vita and the names of three references, should be sent to: **Ottis W. Rechard, Chairman of Search Committee, Department of Mathematics and Computer Science, University of Denver, Denver, Colorado, 80208.**

AA EOE M/F/H.

Bio/dynamics Inc., a leading Life Science laboratory, seeks a Manager, Computer Services. Successful candidate will have Computer Sciences B S with three years experience or M.S. with one year experience designing and implementing data capture and processing (DEC System). Knowledge of systems and programming (Fortran) combined with creativity and enthusiasm are keys for exciting opportunity to set-up department. **Please send resume including salary history to Ms. Mary Zeek, Director, Personnel, Bio/dynamics Inc., P.O. Box 43, East Millstone, New Jersey 08873.** M/F EOE.

Florida

Start the new year with career and/or financial advancement in the most desireable area of the country. Our South Florida clients are looking for good people. If you are a data processing professional with two or more years of experience, send your resume and salary requirements to:

Bruce Hilton (305) 264-7060
Advantage Executive Search
7861 Bird Road
Miami, Fl. 33155

fee, travel and relocation - company paid

N.C.R. PROGRAMMER/ANALYST

Expanding data processing department requires individual with experience in Cobol or NEAT/3. We have a criteron N-8450 running under B-3 and on-line. We are in the process of developing batch communications for our remote sights.

If interested in this challenging position, please send resume and salary requirements to the attention of:

Ron Vautour
S. S. PIERCE COMPANY
10 Wildwood Street
Woburn, Mass. 01801

An Equal Opportunity Employer

PROGRAMMER, ANALYSTS. Requires three years programming experience; knowledge of COBOL, Univac Operating System, and DMS desired. Prefer B.S. in Computer Science or related field. Beginning salary $14,450. **Send resume before February 6, 1980 to The University of Alabama, Employment Office, P.O. Box 6163, University, Alabama 35486.** Equal Opportunity/ Affirmative Action Employer.

MATH SCIENCES POSITION

Instructor, Salisburg State College. Requires master's plus experience, to teach such courses as COBOL, Finite Math and Statistics. Good teaching recommendations, salary commensurate with background. Ours is a congenial dept that combines Computer Science, Math & Stat. SSC is located in a small city in a rural area close to ocean beaches & the Chesapeake Bay.

Dr. B. A. Fusaro, Dept Math Sciences,
Salisbury, MD 21801

COMPUTER SYSTEMS PERSONNEL

Goulds Pumps, a leader in the manufacture of centrifugal pumps offers opportunities to participate in the design and implementation of Advanced Information Systems utilizing IBM 3031 Hardware is an OS/VSI environment.

Successful candidates will have good communications skills, a high level of initiative and the ability to work with others. CICS and/or Data Base experience a plus. The openings are:

- **APPLICATIONS PROGRAMMERS**
  Minimum 1 year programming experience using COBOL required.
- **PROGRAMMER ANALYSTS**
  2-4 years experience in a manufacturing environment preferred.
- **SYSTEMS PROGRAMMERS**
  Multiple positions exist in the areas of OS/VSI, CICS/VS, and Teleprocessing Software such as VTAM and NCP/VS. Applicants should have at least 1-3 years experience. A 2 or 4 year degree is desired, or equivalent compensating experience.
- **JUNIOR SYSTEMS PROGRAMMERS**
  (Recent college graduates)
  (minimal experience)

We offer the qualified applicant an excellent wage/benefit package with growth opportunities in a challenging environment.

Send your resume and salary history in confidence to:
N. B. Strodel

GOULDS PUMPS, INC.
SENECA FALLS, NEW YORK 13148

An Equal Opportunity Employer M/F

'80

PROGRAMMERS

MAKE YOUR FUTURE WITH A LEADER

At Allen Services, 1980 has been declared the year of the computer professional. We have made a major investment in developing and implementing a sophisticated in-house computer system to sustain our rapid expansion (16 offices nationwide). With the completion of this system, we can now reroute those investment dollars to our employees in the form of financial services, bonuses, technical training on our in-house computer system, travel opportunity and unequaled benefits such as:

- Time and ½ Overtime Pay
- Paid Vacations
- Paid Holidays
- Paid Relocation
- Per Diem Allowance
- Dental Insurance
- Health and Life Insurance
- Prescription Drug Plan

As an ASC employee, you can be a valued, integral part of a champion in the DP industry. For more information on your career opportunities, call Toll-Free: **800-543-7583**

ALLEN SERVICES CORP.
212 W. National Road, Vandalia, OH 45377
®

Atlanta	404-321-0051	Houston	713-447-0045	Pittsburgh	412-921-7500
Chicago	312-296-0446	Indianapolis	317-848-1571	Rochester	716-271-7180
Dallas	214-321-7025	Los Angeles	213-553-1988	Toledo	419-865-8800
Detroit	313-362-4700	Naples, Fla.	813-774-3077	Tulsa	918-494-5010
Hartford	203-677-2722	Newark	201-233-6814	Wilmington	302-453-1170

At Allen Services, we care about our employees.
Equal Opportunity Employer M/F

SYSTEMS ANALYSTS

Touro Infirmary, a 570-bed teaching hospital located in the beautiful Garden District of New Orleans, is currently seeking two Systems Analysts for our Computer Science Department. We have an IBM 370/138 Computer.

We would like individuals with one or more years experience using the following computer resources:

DOS/VS
CICS/VS with Command Language
Assembler (a plus)
COBOL
VSAM
DL/1
Data Dictionary
DB/DC Concepts

Salary is commensurate with experience; we have an excellent benefit package including tuition reimbursement, discounts on all hospital services and paid relocation. Please send resume to or call collect Jill Ireland, Employment Manager, 1401 Foucher St., New Orleans, Louisiana 70115 (504) 897-8408.

frank
leonard
personnel

STATE OF THE ART TECHNOLOGY CAREER ORIENTED OPPORTUNITIES FLORIDA LIVING

Frank Leonard Personnel knows what's important to you.

Yes, the proper experience and capabilities are important, but Frank Leonard Personnel places people, not paper. Our work with people means working with personalities, individual goals, families — all the things your resume can't tell us. We know our client companies very well, now we'd like to know you.

EXPERIENCING a GROWTH RATE of over 50% a YEAR our CLIENT who MANUFACTURES DATA PROCESSING PERIPHERALS and COMMUNICATIONS SYSTEMS is looking for TALENTED SYSTEMS SOFTWARE DEVELOPMENT PROFESSIONALS who are SEEKING STATE OF THE ART TECHNOLOGICAL CHALLENGE as FOLLOWS.

- MINI COMPUTER OPERATING SYSTEMS and REAL TIME COMMUNICATIONS SYSTEMS using ASSEMBLER language.
- LARGE SCALE IBM 370 OPERATING SYSTEMS, COMPILERS and COMMUNICATIONS SYSTEMS using ASSEMBLER language.
- SR. SOFTWARE TECHNICAL WRITER EXPERIENCED with LARGE SCALE IBM COMPUTER or USER ORIENTED TERMINAL SYSTEMS and ASSEMBLER LANGUAGE COMPILERS.
- JR. SOFTWARE TECHNICAL WRITER WITH A.S./B.S. in COMPUTER SCIENCE and SOME WORK EXPERIENCE in the TECHNICAL WRITING AREA.

CALL:

FRANK LEONARD PERSONNEL
1211 N. WESTSHORE BLVD., SUITE 100
TAMPA, FLORIDA 33607
813-872-1853

ON-LINE SYSTEMS DIRECTOR

We are seeking an experienced manager to assume responsibility for a nationwide On-line computer system with several thousand terminals. As a candidate, you should be technically knowledgeable in all aspects of on-line systems. You should also have excellent comparable experience and the ability to successfully manage and control a complex multiuser, muti-vendor environment.

This Is an exciting opportunity which offers technical challenges, management challenges, and superb growth potential. The position reports directly to our Executive Vice President. Compensation is outstanding and will be commensurate with your background. To find out more about this opportunity, send us a resume in complete confidence.

CW Box 2165
375 Cochituate Rd., Rte 30
Framingham, MA. 01701

WCG

Career Opportunities in Washington State

West Coast Grocery Company, a regional wholesale distributor located in the beautiful Northwest, offers excellent career opportunities in our expanding Systems and Programming Department.

DATA BASE ADMINISTRATOR

We need someone experienced with system design; structured programming; standard ANSI COBOL; and Burroughs hardware/software to meet this challenging responsibility.

PROGRAMMER/ANALYSTS

If you have two years experience with standard ANSI COBOL and structured programming we want to meet you.

We offer a friendly and stimulating environment. Salaries are negotiable with excellent company benefits. Please send resume with salary requirements to:

Human Resources Department,
P.O. Box 2237,
Tacoma, Washington 98401.

Minority applicants shall be considered on the same basis as non-minority applicants without regard to race.

Burroughs Medium Systems Environmental Software Specialist Southern California Location. If you have a strong background in FORTE/2 and NDL, you should be interested in us. If you are selected you will be responsible for data bases and B874 controlled network here at PCC. Burroughs experienced application programmers will also be considered for other possible openings. The above mentioned positions offer competitive salaries and an outstanding benefit package which includes paid overtime, 14 paid holidays and liberal amounts of vacation. Deadline for application January 28, 1980. Send request for application to: **Pasadena Community College, 1570 East Colorado Boulevard, Pasadena, California 91106. Attention: Personnel Department or phone 213-578-7388.** EOE/AA.

CORPORATE DIRECTOR OF INFORMATION SYSTEM

A Midwestern, multi-institutional health care provider is seeking an individual to monitor, coordinate and plan for the development of its information systems. Applicants must have demonstrated an ability to bring together and work with groups of diverse interest. This position will not be responsible for any computer facility Please state salary requirements. Reply to consultant at

CW Box 2171
375 Cochituate Rd.
Framingham, Mass. 01701

SENIOR PROGRAMMER ANALYST II

TO $27,230

Municipal government in sunny California with Univac 90/60 seeks a senior analyst to design and implement new systems and enhance existing systems. Three years large mainframe and Cobol experience a must assembly language desirable This is a management position with excellent benefits

Submit confidential resume to:

Management Information
Services Department
One Manchester Boulevard
Inglewood, California 90301

(213) 649-7445

AIRLINES
Jr. Systems Programmer

Travel benefits to go with progressive environment. Experience or interest in becoming Systems Programmer 1+ yrs. programming exp. using COBOL and/or ALC to include complex projects, work on PARS/ACP ideal. Macro coding and/or teleprocessing applications a plus. Salary to $18-23,000. Send resume & salary req to:

PROFESSIONAL
SEARCH PERSONNEL
4900 Leesburg Pike #402
Alexandria, Virginia 22302
(703) 671-0010

Sales

SALES MANAGEMENT
COMPUTER TERMINALS

- **Vice President — Sales**
- **National Sales Manager**
- **National Accounts Manager**
- **Regional Sales Managers**

Fortune 500 companies' data entry, editing, computing, and communications applications are our primary targets. The Sykes' developed and manufactured family of intelligent terminal products are leaders in our segment of the industry. One of them, Comm-Stor II is sold and serviced nationwide by the Bell Telephone System. Sykes is a public company growing at the rate of over 50% a year. The above openings are a result of our rapid growth and expansion.

We are looking for candidates with a strong sales management background in the computer industry and who know intelligent terminals and data communications. Positions are located in Rochester, NY except for the Regional Sales Managers who will be based in Chicago and St. Louis.

If you are looking for a sales management position with challenge and excellent growth potential, you should contact us. Please call Don Sheehan at (716) 458-8000, Ext. 106, or send your resume to him at:

SYKES DATATRONICS, INC.
375 Orchard Street
Rochester, New York 14606

We Are An Equal Opportunity Employer M/F

SUPERVISOR - SYSTEMS/PROGRAMMER

An Indianapolis based major manufacturer and marketer of engine components is seeking a systems and programming supervisor. The ideal candidate should have 5 to 10 years experience in a company using an IBM 370/168 computer. Experience in the development of systems in Marketing, Accounting and Manufacturing areas using OS/VSI, VM, IMS and CMS for on-line program development is desirable The position reports to the Data Processing Manager and will supervise 15 to 20 people. We offer an excellent salary range, upward mobility and a generous benefit package.

Send resume and salary history in confidence to:

CW Box 2167
375 Cochituate Road, Rte. 30
Framingham, MA. 01701

DIRECTOR DATA PROCESSING

Rapidly growing Southeastern City is seeking a qualified individual to manage an on-line, interactive data base system. This individual should have experience in personnel management. Candidates must have strong background in communications and data base operations CS Degree plus 5-7 years experience in application management desired. Experience in operation of OS/3-IMS90 helpful. Salary to $30,000. We offer a career opportunity. Send resume and references to:

Max Rhoads, City Manager
City of Owensboro
P.O. Box 847
Owensboro, Kentucky 42301

An equal opportunity employer.

SOFTWARE ENGINEER

Immediate opening in the Springfield division of Bay State Gas Company for a software engineer to perform analysis, evaluation, development and design of application programs; provide technical support in engineering and design of computer systems software and application programs; produce task definitions and estimates of resources required for assigned projects. B.S. degree in engineering, computer science, mathematics or equivalent required with one to four years experience. Real-time computer based systems and data general assembly language programming desirable.

Salary based on experience. Forward resume to Bay State Gas Company, 120 Royall Street, Canton, MA 02021, Attention: Linda E. Carpenter.

An equal opportunity employer

buy sell swap

CASH FOR YOUR VAX • 11/70 • 11/34 RP06 • RP04 • TE16

*WE **BUY, SELL,** & **TRADE** ALL **DEC** SYSTEMS AND PERIPHERALS*

***CALL** 617-261-1100*

AMERICAN USED COMPUTER
P.O. BOX 68, KENMORE STATION, BOSTON, MASS. 02215

CMI

AMERICA'S LEADING SPECIALIST SERVING THE USED MARKET!

303X
New and Used — Sale or Lease
3033-N8
1st Quarter '80 Availability

3168
Several Configurations
Available Thru Feb

3158
Sale or Lease
Model 1's and 3's
Bill Graham

3148
2 MEG
Sale or Lease
Will Reconfigure
Pam Hoban

3138
Short Term Leases
Available Now
Pam Hoban

3145 3135
3125 3115
Bob Southwell

4331
Your Position or Ours
Call Now For Our
Lease Plan
Bob Southwell

4341
We want to Buy or
Sublease Your Machine
We have Early
'80 positions
Ron Baker

IBM Plug Compatible
CDC Omega
ITEL
Don Dupuis

SYSTEM 3
Models
12 and 15
Denny Pennington

SYSTEM 34
All Models,
Upgrades and
Peripherals
Available Now!
Lloyd Marks

3277 3278
Printers/Controllers
Terminals
3741 and 3742
Unit Record
Kay Richard

360 CPU's
1130-2020
Marie Bednarz
2030 2040 2050 2065
and I/O
Joe Romeo

3880
Sale or Lease
Limited Quantities
Also
3370 3350 3340
3330 3420 3803
Pat Callahan

I/O
Available
3203-4, 5 2914
3505/3525 2501
3211/3811 1442
Joe Romeo

Call 1-800-521-9648

CMI CORPORATION
Since 1969
755 W. Big Beaver Rd., 19th Floor, Troy, Michigan 48084. (313) 362-1000
IN CANADA CALL:
John Bastien • Montreal. Que. • (514) 288-8455
Don Dupuis • Windsor, Ont. • (519) 258-8910
TWX 810-232-1667 Member CDA CLA

DATA GENERAL RDOS SYSTEMS

Immediate Delivery

Eclipse Development Systems	$19,350.00
S/200 with 48Kw Core; 2.5 Mbyte Disk; Floating Point; Mag Tape; CRT; Cabinet; Software; 30 Day Warranty	
Nova Development Systems	$12,600.00
Nova 1200 with 32Kw Core; 2.5 Mbyte Disk; Mag Tape; Tty; Cabinet; Software; 30 Day Warranty	
Options:	
A. 4060 and (2) Beehive CRT's	$2,150.00
B. Add-on 2.5 Mbyte Disk	$1,850.00
C. Versatec 1100 Printer/Plotter (with Controller)	$2,500.00

Many Other DG & DEC Systems and Peripherals Available

CALL TODAY (408) 733-4400

minicomputer exchange inc.

WE

BUY • SELL • LEASE

S/3

MODEL 15/12/10

GSC General Systems Corporation

2146 Livernois
Troy, Michigan 48084
Phone: (313) 689-6200
Jerry Roberts
Carole Solano

FOR SALE FEBRUARY 1, 1980

IBM 3148 K00 Processing unit with features 1450, 2152, 3622, 4660, 4954, 6111, 8075, 9080, 9318, 9423, 9571, 9583, 9824.

IBM 3047-001 power unit with feature 9080
Units one year old and in excellent condition

Bids accepted until January 18, 1980, address to

J. Musegaas
Director MIS
P.O. Box 19148
Kansas City, MO 64141

FOR SALE OR LEASE

135 H 4655, 4670, 4672, 6981, 7861, 7862, 3215, 3046
145 HO 4768K AMS, 3 ch., 3274, 8810, 7855, 3215
145 I2 4660, 2152, 6111, 6982, 6983, 8810, 2001, 3215
145 HG2 6982, 4660, 8810, 2152, 6111, 3047, 3215
155 JOO 1433, 3215, DAT
155 JI 1433, 3215, all IBM
2-3803-1 dual density (1792)
8-3420-3 dual density (3550)
3811/3211 Printer & Control with P11 trains available
168 Memory
3 Meg NATL SEMI

3033N8 — March 1980

Bob Stevenson
Chuck Stabile
Steve Zaleskie
(516) 488-7676

Tom Harris
Tommy Talbot
(415) 397-3969

Member of Computer Lessors Association and Computer Dealers Association

---

Buying • Selling • Leasing
IBM
Tape • Disk • Memory
Terminals
Fast
Dependable
Professional Service
First Computer Corp
4660 Beechnut
Houston, Texas 77096
713-666-3033

NEW IBM SYSTEM 34 E-35

WITH COMM.
"650" LPM PRINTER
5 CRTs
AVAILABLE NOW
PRICED TO SELL

617-261-2700

WE WANT TO PURCHASE

158 CPU — System 3158

with following features

F/C 1433 3RD Block MPX CH
4650 ISC
7840 3213 Printer Attach
2150 Control Store Ext.
7905 2 CH Switch
7730 Extended Feature
2151 Expanded Store Control
6111 Register Expansion
3213 MOD 1 Console Printer

Proposal to include service record, prices Nett F.O.B.
Delivery to be taken March 1980.
Please reply to:

Purchasing Officer, G.P.O. 2138
New York, N.Y. 10001

COMDISCO®

Your First Choice in the Second Market

IBM Processors

4331
System
Available for
Immediate Delivery

3135
Immediate
Delivery,
Sale or Lease

3138
Systems
Available,
Sale or Lease

3145
All
Configurations,
Available Now

3148
Immediate
Delivery,
Sale or Lease

4341
Try a 370/155 or
370/158 Instead

3155
Immediate
Delivery —
w/DAT

3158
Most
Configurations,
Sale or Lease

3165
With DAT,
Machines
Available Now

3168
Machines
Available,
Sale or Lease

3031
2 Meg Available
1st Qtr 1980

3032
System for
Lease — 6 Meg
January

3033
3033-N4 • 2/15/80
3033-N8 • 8/15/80
Systems for
Lease Only

470
Systems
Available,
Sale or Lease

Memory
145, 148, 155
158, 165, 168, 303X
IBM & OEM
Memory Available
Call Rosemary Geisler
312/698-3000

2880-2
Channels Available
Sale or Lease

IBM Peripherals

3330/40
Immediate Delivery
Sale, Lease, Trade

3350
- Wanted to Purchase
- Available for Sale or Lease

3420
All Models
Available
Flexible Terms

3880
Control Units
Available Now
Lease Only

IBM Etc. . .

3704/5
3704-A1, 3705-E1
Machines Immediately
Available. Call
Karen Johns
312/698-3000

327X
Terminals, Printers
& Controllers
Call
John Christopher
312/698-3000

3203-5
Printers Available
Lease Only
Limited Availability

Features
Many Features
Available
from Inventory

Member CDA/CLA

We Can Put It Together

Branch Offices

Atlanta	404/256-5956
Boston	617/542-4005
Chicago	312/698-3000
Connecticut	203/853-6966
Denver	303/399-4588
Fort Worth	817/534-1774
Houston	713/757-1216
Los Angeles	213/641-5100
Michigan	313/644-1500
New Jersey	201/568-9666
Pittsburgh	412/344-3610
San Francisco	415/944-1111
Washington, D.C.	301/441-1000

International

Latin America	305/266-5682
Montreal	514/747-4729
Toronto	416/498-7220
Paris	297.20.00
Switzerland	21/71-09-35
West Germany	40-522-30-55

Corporate Headquarters

Comdisco Inc.
9701 W. Higgins Road
Rosemont, Illinois 60018. . . . 312/698-3000
TWX #910-253-1233

DEC LSI-11 Components

Dependable service
at discount prices

Domestic
and Export

**Mini
Computer Suppliers, Inc.**
25 Chatham Rd., Summit, N.J. 07901
Since 1973
(201) 277-6150 Telex 13-6476

©Mini Computer Suppliers, Inc
1979

1/11/80

4331

CMLS
Computer Multiple Listing Service
(703) 560-8350

**DATA GENERAL
SPECIALISTS
FOR**

**Surplus New & Used
Equipment & Systems**
with full depot repair facilities.

CALL US
WE TAKE THE TIME.
— WE CARE —

JM Associates
601 W. Chapel Avenue — Cherry Hill, NJ
08002
609-663-1115

FOR SALE OR LEASE

IBM 315S with DAT

**AND 2 MEG of AMS/PSU
AVAILABLE NOW**

FOR LEASE

IBM 3033-N8

**"NEWPORT"
MARCH, 1980**

IBM 3880's

JANUARY-FEBRUARY, 1980

TNCC
THOMAS NATIONWIDE COMPUTER CORPORATION

516-752-1000 312-692-5900

SALE or LEASE Immed. Avail.

3803-2 Controller

4331 Model J

HI-SPEED I/O

SET-UP with UCS

$1,050.00per month

(based on 36 mo. term)

Call George Gilman
Toll FREE Outside N.Y.
800-221-8438

IOA DATA CORP.
383 Lafayette Street
New York 10003
(212) 673-9300

DEC

FOR SALE

- 11/34,192KB,2-RPR02
- RK06
- RK05F & RK11D
- RK05F & RK8E
- DL11E, A
- DL11WB
- MMV11A
- MS11JP & MM11DP

Western Data Systems
213/375-0523
PO Box 7000-182
Redondo Beach, CA 90277

TIGER COMPUTER
415 Madison Ave., New York, N.Y. 10017 (212) 532-1500

CONTACT D. MOYER

Leasa Short Term
370/148-K
ISC W/Madrids
Avail. Jan. 15. 1979

Lease
4331's & 4341's
Early Delivery

3033-N8
Avail. for Lease
Feb. 15. '80

3033-N8
Avail. for Lease
April 15. '80

For Lease
AMDAHL
V 6 System

370/168-U38
For Lease
Jan. of 1980

Buy/Sell/Lease
3350's 3830-1's
3340's 3830-2's
3344's 3803-1's
3330's 3803-2's
All 3420 Tape Models

370/115 H2
Full Faatura
Avail. Immed.

Leasa or Sala
370/138's
370/148's
and
All paripharals

Sala or Laasa
360/30 thru
360/65
Month to Month
Laasas Availabla

System 34
Leasa Availabla

3033-U8
For Lease
Also Purchasa
Lease Back

138, I to J
and
148, J to K
Memory Upgradas

For Leasa
370/165
W/DAT
Avail. Jan.

Avail. Jan.
For Laasa/Sala
AS-5 System

SPECIAL
Short Term Lease
370/138-J
3046-1

A TIGER INTERNATIONAL COMPANY

MEMBER CLA/CDA

3033-N8

March 1980

4331-J	Feb 1980
4341-L	Sept 1980
3203-5	Feb 1980
3880	Feb 1980

Call Ron Creed
313-356-8678

Argecy Financial Corporation
29260 Franklin Rd., Suite #417
Southfield, Michigan 48034

3032
SALE OR Purchase/Leaseback

— BUYER WANTED FOR SYSTEM PRESENTLY LEASED FROM IBM. (1 YR. ACCRUALS)

OR

— LESSOR WANTED FOR OUR INSTALLED SYSTEM. (1 YR. RENTAL CREDIT)

FOR RFP CONTACT:
R.J. GOODE
AT&T LONG LINES
ROOM 5C102
BEDMINSTER, N.J. 07921
202-234-6269

FOR SALE

System 3 — Model 15D

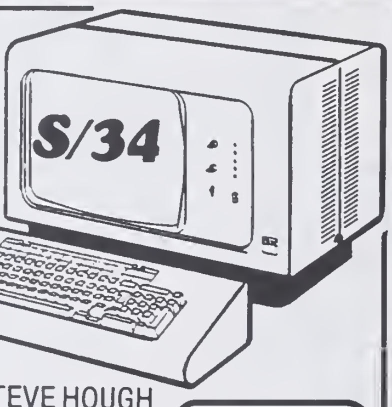
System 3 — Model 10

System 32

System 34

URS
Since 1969

Call: Bob Luck
(617) 438-4300
66 Montvale Ave.
Stoneham, MA 02180



S/34 DELIVERY POSITIONS

E34's — E35's — 3262's
12 Systems Available

Jan./Feb./Mar./April

CONTACT: STEVE HOUGH
PEARL EQUIPMENT COMPANY, INC.
• P.O. BOX 24026
• 4717 CENTENNIAL BLVD.
• NASHVILLE, TN 37202
• (615) 383-8703

Pearl® EQUIPMENT CO., INC.

MEMORY EXPERTS

Call Us First
For Your
360-370-303X
Memory Requirements

CENTRON — DPL
(612) 884-3366

IBM Unit Record Equipment

Mach	Sale	Lease	Specials		Mach	Sale	Lease
026	$ 750	$30/mo	087	$2100	085	$1200	$60/mo
029	$1750	$50/mo	1403(2)	$3900	088	$2250	$100/mo
082	$ 750	$30/mo	2203(1A)	$1500	129	$3200	$110/mo
083	$1700	$60/mo	2020(C1)	$1500	548	$1500	$60/mo
084	$2500	$90/mo	3348-35	$ 550	557	$3100	$100/mo

Other Machines Also Available

Disk Packs, Cartridges, Modules

3336-11	$299.00	2316's	$99.00	DATA MOD's	$899.00
3336-1	$149.00	1316's	$39.00	CARTRIDGES	$39.00

We Purchase Used Packs & Modules

New Memorex Mag Tape from $6.99 ea.
100% Recert Mag Tape from $4.99 ea.
Memorex Diskettes & Non IBM Packs in Stock.

Thomas Computer Corporation
600 North McClurg Court Chicago, IL 60611 (312) 944-1401

BUY • SELL • LEASE • TRADE

Systems 3/32/34/38

CALL FOR A QUOTE.
(612) 333-6476

NORTHERN GROUP LTD, INC.
2124 IDS CENTER
MINNEAPOLIS, MN 55402

34 and 38 delivery positions available.

FOR LEASE OR SALE

		AVAILABILITY
1403/N1 2821/2		1/30/80
3211 3811		NOW
2501/B1		1/10/80
4331 J 3203/5		1/15/80
3830/2 2151 6111	S/N 40831	2/4/80
2-3350/A2F's 8150	S/N 20172 S/N 24801	2/4/80
3-3350/B2's	S/N 40217 S/N 40891 S/N 44600	2/4/80

If you need extra features or cables, call us:

WM&F Western Marketing and Financial
Western Office - 415-526-9221
Midwest Office - 312-332-6310

For Lease
IBM 4341-L
Available May 1980
IBM 3031 — New
Available Dec./Jan.

Contact:
Bob Kendall
Leasing Dynamics, Inc.
1717 East 9th St.
Cleveland, Ohio 44114
(216) 687-0100

AMPEX USERS

WE
BUY - SELL - REPAIR

- DIGITAL TAPE DRIVES
- DISK DRIVES AND RELATED ASSEMBLIES

Call toll free
800-423-5321 Ext. 11
in California
213-889-6031 Ext. 11

TYMSHARE®
Equipment Support Division

DEC NOW

- 11/40 processors and systems, any amount memory
- 11/60 128 KW new systems w/RK07's
- 11/23, 7650 new
- 11/34 w/RK05's, RL01, or RK06
- 11/70 w/RP06 or RM03 new and used
- Peripherals, please call

WANTED FOR CASH

any and all DEC systems and peripherals all inquiries immediately answered

DATAWARE SYSTEMS LEASE, INC.
30 Bay St.
Staten Island,
N. Y. 10301
(212) 447-4911
Telex 429394

dataserv COMPUTER MARKET PLACE™

We're changing the way companies buy, sell and lease IBM computers

Check out the variety of financial options you get at **dataserv**

With Dataserv you get the equipment you need and the financial arrangements that serve you best. That's another good reason why more and more companies depend on Dataserv.

CPU'S
370
360

GSD
32
34
38
Sys/3

TAPE
3410
3420

DISK
3330
3340
3344
3350

MICR
1419
1255

PRINTERS
1403
3203/3211

DATA ENTRY
3277
3741

I/O
3505/3525
ATM's

Member Computer Dealers Association

ATLANTA	404/523-6043
CHICAGO	312/951-6344
CLEVELAND	216/921-3960
DENVER	303/893-9648
DETROIT	313/961-6547
LOS ANGELES	213/626-0208
MINNEAPOLIS	612/544-0335
NEW YORK	212/926-6530
PHILADELPHIA	251/561-3966
SAN FRANCISCO	415/398-2002

OR CALL TOLL-FREE
800/328-2406

dataserv headquarters
dataserv building
9901 Wayzata Boulevard
Minneapolis, MN 55426

CMI

AMERICA'S LEADING SPECIALIST SERVING THE USED MARKET!

370/168
Attached Processor
Available Immediately
Sale or Lease

Call 1-800-521-9648

CMI CORPORATION
(313) 362-1000

FOR SALE
AVAILABLE NOW

IBM 155J, 5 channels
$50,000 with 2MB OEM
$65,000 with 4MB OEM

CALL MARVIN HABER
FEDERAL DATA CORPORATION
(301) 986-0800

SYSTEM
32
IBM GUARANTEED
$9800
CALL JOHN MACMAHON
617-261-2700

FOR IMMEDIATE SALE
TWO PERIPHERALS T-COMM7 UNITS

Each unit has:

CP24/31 Communications Processor with 24K Core Memory
ILU for up to 31 lines
PCC-105 Minicomputer-Controller
KSR System Console
TP-200 System Library
Real-Time Clock
Cabinet for mounting power supplies and accessories
PERI-PACS 16K Extended Memory Module
10 Line Interface Modules

Contact: W. Harkell
(315) 735-9537
Upstate Computer Center, Inc.
9882 Route 49
Utica, NY 13502

FOR SALE
HONEYWELL 61/60 COMPLETE WORKSTATION SYSTEM

1 — 10 K CPU — Virtuel Memory
1 — 12 K Front End Processor
1 — 450 LPM Bufferad Printer
3 — 5.7 MB Disc Drivas with Controllar
40 — M4005 Certified Disc Pecks
4 — Lear Sieglar ADM-1 CRT's with epproximetely 250 feet of cable
1 — IBM 025 Cerd Punch

All of tha ebova aquipment undar continuous HIS, IBM & Laar Siegler Meintenanca

System price INCLUDES the following ON-LINE application softwara together with EXCELLENT DOCUMENTATION Operetas undar GCOS Level 61.3.

Accounts Peyable
Payroll
Sales Ordar Processing
Seles Anelysis
Accounts Receivebla
Genarel Ladger

CONTACT:

Gordon F. Nahas, Controller
Wilkins-Rogers, Inc.
27 Frederick Road
Ellicott City, MD 21043
(301) 465-5800

AVAILABLE April 15, 1980

For Sale or Lease

3830-2	4331 J
3333-1,11	4341 K
3330-1,11	3203-5
3880	129-3
8809-1A	3210-2
	3803-1

BARRETT
CAPITAL
& LEASING
CORPORATION

707 Westchester Avenue
White Plains, N.Y. 10604
(914) 682-1960

Priced for Quick Sale by Owner

DEC PDP 11/34

Sys. 354 w/CIS-300/RT-11 Llc.
CURRENTLY ON DEC MAINT.
64KB Memory, (1) VT52 CRT w/DL11W, (1) LA 180 Printer, (1) RK05F, (1) RK05J, in corporate cebinet, DEC desk with storege, all DEC diagnostic pecks & menuels.

ALL FOR $22,990
or $19,990
without CRT & Printer
Also 20 RK05 Disks $35. ee. w/shockwetch

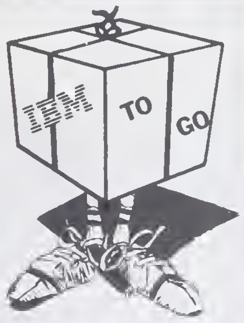
J. L. Wyner,
Shawmut Mills
Box A, Stoughton, MA 02072
(617) 344-3210

BUY•SELL•LEASE

3741 3742
I.B.M.
029 129

WILLIAM MARION COMPANY, INC.
P.O. BOX 309, HACKENSACK, N.J. 07602
CALL (201) 343-4554

SOURCE
DATA PRODUCTS



34 SYSTEM

SPEEDY DELIVERY

BOB LOSEY (408) 688-0941

LEASING

System 3	Model 10, 12 & 15
3741 & 3742	129's
029's	System 34 & 38

vantage
Computer Marketing, Inc.
1915 Peters Rd., Ste 207
Irving, TX 75061
(214) 438-8211
TWX 910-860-5060

LEASE FROM GECC

3033 - N4

FEBRUARY '80

Call: Randy Terk or
Rick Crannell
(203) 227-5173

303X
4300
8100

Your Delivery
or Ours
4-8 Year
Lease Terms

GENERAL
ELECTRIC
CREDIT
CORPORATION

55 West State Street
Westport, CT 06880

GECC FOR ALL YOUR FINANCING REQUIREMENTS

BUY · SELL · LEASE

ALL CPU's & PERIPHERALS

360	303X
370	4300 Series

Diebold Computer Leasing, Inc.
(201) 569-3838
177 North Dean Street, Englewood, New Jersey 07631

Member: Computer Lessors Association
and Computer Dealers Association

IBM
* FOR SALE *

— Available Immediately —

Two 370/135's $25,000 each

Both model FE (96K) with 384K C.D.C. add on memory.
Both have 3274, 4640, 4670, 4672, 6981, 6982, 7855, 7861 features.
Both have 3046 power unit and 3215 console

Four 1403 N1 Printers	$12,500 each
Two 2821-2 Printer Control Units	$10,000 each

All Units have been under continuous maintenance.

CONTACT: David L. Bercaw
(813) 224-5467

Exchange Operating Services Corporation

P.O. Box 23456,
Tampa, Florida 33623

3272	3741
3277	3742
3286	129'S

SYSTEM 34

BUY — SELL — LEASE
JIM CARLETON

370/138
370/148

BUY — SELL — LEASE
JOHN MILLS

National Computer Equipment Corp.
25614 Jefferson
St. Clair Shores, MI 48081
(313) 774-7400

BSI

BURROUGHS CPU'S

B4700 — Complete Systems
81726 — Complete Systems
B80 and B800 Minicomputer

PERIPHERALS

Disk Pack Drive & Controllers
Magnetic Tape Units
Memory Modules — I/C & Core
B500 Peripherals

TERMINALS

Available for delivery hard
to find TD831's

IBM

Series 1 — All Models
& Peripherals

(303) 922-8331
2480 West Alameda Ave.
Denver, Colorado 80223

CDA

BROKER IN DEC COMPUTER SYSTEMS AND COMPONENTS

C.D. SMITH
730 N. Post Oak Road
# 301
Houston, Texas 77024
(713) 686-9405

**FOR SALE
OR
LEASE**

IMMEDIATELY AVAILABLE

(1) SYSTEM 34-E35 NEW
(3) 5251-12's

ALSO

WANT TO BUY

USED SYSTEM 34 MODEL C23

BLUEBONNET COMPUTER COMPANY
1214 W. 5th
Austin, TX 78703
(512) 476-9362

WANT TO BUY
BUNKER RAMO

Bank Control System 90

Call Sonny Monosson
(617) 261-1100

DEC EQUIPMENT FOR SALE

Model #	DEC List	NCCS Price
M 11-BA	$18,590	$16,000
MJ11-BE	11,550	10,000
RWM03-AA	25,000	23,000
RM03-AA	19,000	18,000
TWE16-AA	18,850	17,000
RK05J-AA	5,100	2,800
RK11J-AA	11,700	7,500
RL11-AK	5,100	5,100
RX211-BA	3,900	3,900
BA11-ES		500

Used RK05 Packs — $25.00 each or 5 for $100.00

MIXED VENDOR 11/34 SYSTEM

11/34 Processor with 256KB MOS Memory 67MB CDC Disk Drive with Emulex Controller LA36 System Console, 8-channel Multiplexor
300 LPM Printronix Printer $39,500

TAPE DRIVES

2 AMCOMP 125 ips Dual Density Tape Drives
with Controller $10,000

Mr. Richard A. Baldwin
North County Computer Services, Inc.
2235 Meyers Avenue
Escondido, CA 92025
714-745-6006

*** All equipment available immediately ***

Short or Long Term Leases From RANDOLPH

4300's
303X

. . . and all 370 CPU's
and peripherals

800-243-5307

CA

Randolph Computer Company
Division of The Bank of Boston
537 Steamboat Rd., Greenwich, Ct 06830
(203) 661-4200

CDA

PRINTERS

AVAILABLE NOW
FOR
SALE OR LEASE

3203-5	3211
1200 LPM	2000 LPM

NF

NF COMPUTER SALES & LEASING CORP.
1211 W.22nd Street
Oak Brook, Ill. 60521

(312) 920-8181

CDA

Member: Computer Dealers Association

ENTREPRENEURS
WITH DEVELOPED SOFTWARE

Successful software development and marketing company is seeking a generalized retrieval report generation system written in high-level language (preferably COBOL). This company has an extensive sales/marketing force and can make your product a household word.

Please write

CW Box 2168
375 Cochituate Rd.
Framingham, MA 01701

O.P.M. LEASING SERVICES, INC.

The Custom Leasing People

Branch Offices

ATLANTA	(404) 953-0926
BOSTON	(617) 933-8451
CHICAGO	(312) 945-8150
DENVER	(303) 499-4488
DETROIT	(313) 996-5811
HOUSTON	(713) 367-1668
LOS ANGELES	(213) 278-4117
MINNEAPOLIS	(612) 884-9980
NEW JERSEY	(201) 635-1092
N.Y. FINANCIAL DISTRICT	(212) 747-0220
ST. LOUIS	(314) 434-6330
SAN FRANCISCO	(415) 383-4111
WASHINGTON, D.C.	(202) 656-8676
International Offices	
LONDON	01-222-4031
PARIS	1-549-1815
COLOGNE, GERMANY	221-763-1458

Corporate Headquarters
O.P.M. LEASING SERVICES, INC.
71 BROADWAY, NEW YORK, N.Y. 10006
(212) 747-0220 (800) 221-2674

Short and Long Term Lease Plans Available

CPUs

370/135
370/145
370/155
370/165
All Configurations Available For Sale or Lease

303X Series
Purchase/Leaseback of Installed or OPM Supplied

370/158
370/168
All Configurations Available For Sale or Lease

4300 Series
All Configurations Available For Sale or Lease

370/138
370/148
All Configurations Available For Sale or Lease

Amdahl All Models
CDC Cyber 74
Univac 1100 Series
All Configurations Available For Sale or Lease

FEATURES/MEMORY

370/158 & 168
ISC/Madrids
All Channels
For Sale or Lease

IBM Memory:
370/158s, 168s, etc. or 3000 Series Machines
For Sale or Lease

OEM Memory:
155s, 158s, 168s, either EM&M, NSC, Intel or STC
For Sale or Lease

PERIPHERALS

3333/3330s
3350s
3830s
All Configurations Available For Sale or Lease

3803 Controllers
3420 Tapes
All Models and Configurations Available For Sale or Lease

3211/3811
1403/2821
All Configurations Available For Sale or Lease

Complete Installation and Planning Support Provided

43X1

CMI CAN DELIVER
3135's 3148's
3138's 3158's
3145's
FOUR WEEK DELIVERY
Bob Southwell
1-800-521-9648 (313) 362-1000
(We also want to lease your 4300)

XEROX USERS

WE
BUY - SELL - REPAIR

- COMPUTER SYSTEMS
- PERIPHERALS
- SUBASSEMBLIES AND SPARE PARTS

Call toll free
800-423-5321 Ext. 14 or 15
in California
213-889-6031 Ext. 14 or 15

TYMSHARE®
Equipment Support Division

Xerox 1200

Completely Refurbished
For Sale or Lease
Favorable Terms

Call
May & Speh
Data Processing, Inc.
(312) 620-8060

FOR IMMEDIATE SALE

NCR 399, 20k memory, two cassette drives, assembler language, magnetic ledger cards with right rear eject, 35 CPS Printer with continuous forms feeder. Programmed for payroll, certified payroll, union reporting, accounts payable, job costing, general ledger and equipment costing.

FOR IMMEDIATE SALE

NCR 8230 Computer System, 80k memory, IMOS 68, 200 LPM printer, one each 5MB fixed disc, 5MB removable disc drive, additional 10MB fixed disc, two CRT terminals. Programmed in COBOL for payroll, accounts payable and general ledger.

Contact Dick Nelson or R.M. Hatley, P.O. Box 233, Council Grove, Kansas 66646 or call 316-767-5184.

TELETYPE 43 —
$1295
Pin Feed RS232 New
-Limited Quantity
also
MODEMS from
$159
COMPUTERSHOP
288 Norfolk St.
Cambridge, Mass. 02139
617-247-0700 or 661-2670

Contact: Bernie Gest
(215) 782-1010
7704 Seminole Ave.
Melrose Park, Pa. 19126

Computer Marketing Inc.

SALE/LEASE
IBM Peripherals

TAPES:	3420 Models 3,5,7,4,6,8
PRINTERS:	3203, 3211, 1403, 3287
DISK DRIVES:	3330, 3340, 3344, 3350
CONTROLLERS:	3803, 3811, 3830, 2821
CARD I/O:	3505, 3525 & 2540.
CRT's:	3278, 3277, 3274, 3276
MICR:	1419 Single & Dual Address 1412 Off Line

IMMEDIATE DELIVERY!

IMMEDIATE DELIVERY

DATA GENERAL CS-30

ALM, KANE,
ROGERS, & CO.
J. BALINT
(312) 346-1620

FOR SALE

IBM SYS/3 MOD 10

5410 A12	CPU 8K
4100	MFCU ATTACH.
5424 A1	MFCU 250CPM
2/BST/45	20 MEG. EACH DISC.
BST/550	PRINTER 550LPM
BST/3	MEMORY
	32K TOTAL SYSTEM

1 Owner
Memorex and IBM Maintenance
Available IMMEDIATELY

Call L. Triplett 312/221-1200

FOR SALE BY OWNER

Qty.	MACHINE/SERIAL	MODEL FEATURE	DESCRIPTION	PRICE PER UNIT
2	3165-60114 & 60044	K	Processing Unit	$50,000
		1432	Buffer Expansion	
		3850	Extended Channels	
2	3066-60129 & 60050	1	System Console	9,000
2	3067-60117 & 60040	1	Power & Coolant Dist. Unit	7,000
8	3360-50329, 50339, 50355, 50367, 50128, 50130, 50175, 50221	5	Processor Storage 524,288 Bytes each	10,000
2	2860-60007 & 60825	2	Selector Channel	15,000
2	2870-71156 & 70870	1	Multiplexer Channel	10,000

IMMEDIATE DELIVERY

CONTACT: Charlier Kandziolka, Manager
Information Processing

DRESSER INDUSTRIES, INC.

412/928-3812

FOR SALE

4 EPIC DATA ENTRY TERMINALS

- Modal 1647-59 with RS232C interfaca (ASC II)
- Bedge Reeder
- 15 LED's for prompting
- 32-cheracter A/N display
- 80-column ANS1 cerd reeder
- 4800 Beud to host computer
- Alpha and numeric keyboerds
- These units heve navar been usad

CONTACT: Rita Bialous

GILROY FOODS, INC.
P.O. Box 1088
Gilroy, Ca. 95020
Call: (408) 847-1414 Ext. 471

2914 SWITCH

2 X 8
OR
4 X 8

AVAILABLE NOW
SALE OR LEASE
NF COMPUTER SALES
& LEASING CORP.

312/920-8181

1st QTR
1980

3033-N
SALE OR LEASE

AVAILABLE NOW!
3880's AND 3203-5's
SALE OR LEASE

PRIME

PRIME LEASING, INC.
1701 WOODFIELD DR.
SCHAUMBURG, IL 60195
Please call Amy Walters
(312) 843-1818

Lease Only
AVAILABLE

Jan. 25
3033

RANDOLPH
Computer Company
Division of The Bank of Boston
537 Steamboat Road
Greenwich, Ct. 06830
800-243-5307
(In Connecticut, 661-4200)

Member
Computer Lessors Association

IBM Terminal & Communications Specialists

IBM 3101 & 3102 ASCII
TERMINALS AVAILABLE NOW
270X, 370X, 327X, 328X, etc.

We Buy - Sell - Lease

BERLENT INDUSTRIES, INC.

1975 Hempstead Turnpike
East Meadow, New York 11554
(516) 794-9722

Member:
Computer Dealers
Association

SALE OR LEASE

SYSTEM/34

- E35's
- Many Models
- 30 Day Avail

SALE OR LEASE

SYSTEM/3

- Complete **MOD 15** Systems
- Short Term Leases
- Model 8, 10, 12

We Need
To Buy
Your GSD
Equipment

SYSTEM/3

- 3340, 44
- 3411, 10
- 3741, 42
- 3277

SYSTEM/32

- All Models

Owens Computer Group
7300 W. College Drive
Palos Heights, Il. 60463
(312) 448-4300

FOR SALE BY OWNER

IBM SYSTEM 3/15D

with 3340, 3344, 5424,
1403, 5421, 3751 & 3277's
FULL SOFTWARE COMPLEMENT
Available May/June 1980
Bids Requested
Contact: David R. Schuchts
Marmon/Keystone Corporation
P.O. Box 992, Butler, PA 16001
(412) 283-4500

370/125'S 370/115'S

For Sale* Lease* Purchase
****Purchase Leaseback***

Short Term Leases Available Also all Peripheral Units.

CORPORATE COMPUTERS, INC.

(203) 661-1500
Member CDA
115 Mason St., Greenwich, CT 06830
Member Computer Dealers Association

370/145

w/Any Size Memory
Sale or Lease
Diebold Computer
Leasing, Inc.
(201) 569-3838

FOR SALE

DEC

11/34A
128KB MOS, 40 MG DISK
TAPE, CRT, PRINTER
CTS 300
ALSO TE16 & TU16
713-686-9405

For Lease

IBM 4341-L

Sept. 1980 Del.
ord. #3514-SD
want to buy 1x4 3420
mod 3 w 3550 ftr.
Call (213) 887-1040
TBI Computer Sales

NCR USERS

YEAR-END SAVINGS

SPECIAL PRICES ON INVENTORY ITEMS

657 Disk & Controller	656 Disk & Controller
626 Printer Controller	636 Cassette Reader
626 & 640 Printer PKG	8250 Complete System

Several 101 Configurations

Computer Connection Corp.
8210 Penn Ave. So., Minneapolis, MN 55431
(612) 884-0758

BRAND NEW WHILE THEY LAST!

• Diablo	1650-RO	$2550	(20 only)
• Diablo	1640-RO	$2450	(4 only)
• TI 820	Full ASCII	$1850	(8 only)
• TI 810	BASIC	$1550	(2 only)
• ADDS	Regent 20	$ 895	
• ADDS	Regent 25	$ 950	

The Supply Depot, Inc. • (213) 992-6060
California only: (800) 382-3655
Ask for Nick or Dave • Dealer Inquiries Welcome

DEC PDP-11 Equipment FOR SALE

MJ11-BE	11/70 CORE
MM11-DP	11/34 CORE
R K05	DISCS
RPR04	DISCS
LP11-VA	PRINTER
CTS11-KM	CARD RDR/PUN
CR 11	CARD RDR
DZ11	8 USER MUX
DL11-E	ASYNC INTERFACE
DU11-DA	SYNC INTERFACE
KG11-A	ARITH OPTION
LA36	DECWRITER II
VT52	SCOPE

CARL R. BOEHME
AND ASSOCIATES, INC.
SPECIALISTS IN
DIGITAL ENGINEERING
408-727-2666

FOR SALE

two RK05J and two RK05F Disk Drives

All under DEC maintenance
with 24 disk packs
written inquiries to:
Office Specialists
120 Tremont St.
Boston, Ma. 02108

REQUEST FOR PROPOSAL

Chambersburg Waga Tax Board is requesting proposals for hardware and/or software to handle the Chambersburg Waga Tax Offica deta processing requirements. Software neads are in the Wega Tax system end General Ledger system areas. Herdware needs are in the small to medium siza configuration· Chambarsburg is located in tha southeastern part of Pennsylvania, epproximately 30 miles south of Herrisburg, Pa., and 15 miles north of Hegerstown, Md. For details, please write:

**Management Services
Department
Stockton Bates & Company
Robinson Building
15th and Chestnut Sts.
Phila., PA 19102**

LEASING?

SUBLEASE AVAILABLE

3148-K, ISC, 2150, 6111, 3047	MAR '80
3031-2, 3017, 3036	JAN '80
3031-2, 3017, 3036	FEB '80
3033-U6, 3037, 3036	FEB '80

POSITIONS AVAILABLE

3033 N4	February 15, 1980
3033 N8	February 15, 1980
3033 N8	March 21, 1980

- We'll write a short-term or long-term lease — on YOUR system or OURS
- We'll configure a total system or part of one to your specifications

COMPUTER CAPITAL CORPORATION

274 RIVERSIDE AVE., WESTPORT, CT 06880
203-226-8301

CMI

AMERICA'S LEADING SPECIALIST SERVING THE USED MARKET!

USED CDC SYSTEM

4801-2 (½ meg.)

(80% more powerful than a 4331)

with
(2) CDC **3830-1** Disk Controls
(8) CDC **3330-1** Disk Drives
(1) CDC **3803-1** Tape Control
(3) CDC **3420-1-4** Type Drive

Available — 30 Days

Don Dupuis

Call **1-800-521-9648**

CMI CORPORATION
(313) 362-1000

Contact: Bernie Gest
(215) 782-1010

7704 Seminole Ave.
Melrose Park, Pa. 19126

Computer Marketing Inc.

IMMEDIATE DELIVERY

3344 DISC UNITS
3420-6 TAPE DRIVES
1419 MICR
3274 3276 & 3278's

WANTED

3350's A&B2

CALL FOR BIDS SURPLUS PROPERTY

SURPLUS SALE NO. 862

Sealed proposals will be received at the office of the City Clerk, Room 338 County-City Building, Tacoma, Washington, until **11:00 A.M., Monday, February 4, 1980** for purchase of any or all of the following salvage items: (Weights are estimates)

1 CALCOMP 1035 Disk Controller with
3 CALCOMP 235 II Disk Units (6 spindles, Dual Density, 1.2 MB)

Proposals must be accompanied by a Certified or Cashier's check in an amount not less than ten percent (10%) of the amount bid.

The City reserves the right to reject any or all bids received, as serves the City's best interest, including fluctuating market conditions in value of salvage items.

Complete details and proposal forms may be procured from the office of the **Purchasing Supervisor, Tacoma Public Utilities Administration Building, 3828 South 35th Street, Tacoma, Washington,** or by phoning **593-8249.**

SEE SPECIAL AD on page ID/2

ECONOCOM
901-767-9130

---

the DEC specialists

BUY
LEASE
SELL

IN STOCK

11/34A
SYSTEMS
with Dual RL01's
VT100's & LA120's

****

Many other systems available from our million dollar DEC Inventory

DATALEASE

800-854-0350
In California Call
714-632-6986
Telex: 692439
2770 East Regal Park Drive
Anaheim, California 92806

NOTICE OF INTENT TO ACQUIRE COMPUTER EQUIPMENT

The State of Oregon, acting by and through the State Board of Higher Education, intends to contract with Control Data Corporation (CDC) for the following equipment (listed by CDC model number):

1. **170-720 Central Processor**
2. **10501-702 Memory**
3. **10513-725 Motor Generator**
4. **Two 7155-1 Controllers**
5. **10396-I Disk two-channel access**

This equipment will replace the following CDC equipment:

1. **73-4 Central Processor**
2. **65037 Motor Generator**
3. **Two 7054-1 Controllers**

The remaining peripheral equipment on the present CDC CYBER 73 system will be retained. Within one week of this notice vendors having equivalent equipment must contact

Dr. Mads Ledet
Office of Educational Systems
P.O. Box 3175
Eugene, Oregon 97403
503/888-5873

IBM 370/4300 Peripherals

New IBM	Ship Date
3203-5's	Feb., 1980
3880-1	Feb., 1980

COMPULEASE, INC

P.O. Box 160
Dover, MA 02030
(617) 785-1107

EQUIPMENT AVAILABLE

CPU	Currently Available For Lease	Date
370/145		
145-J2 (4660, 8100, 6982, 6983, 6984, 8810, 2001, 7855, 3215)	15 months	2/01/80
370/158		
158 Memory - 2 megs (NSI)	sale or lease	now
M upgrade and 3058 for 158	sale or lease	now
370/168		
M upgrade and 5050's for 168 MP	sale or lease	now
ISC and madrids for 168	lease only	now
168 Memory - 4 megs (IBM) (includes 5th meg)	lease only	now and 1/01/80
2860-1	lease only	now
2860-2	lease only	1/01/80
2880-1	lease only	1/01/80

370/3033

Memory Increment	Availability Date
U6 - U8	December, 1979
U8 - U12	December, 1979
U12 - U16	December, 1979

CONTACT:

LFC

Jack A. Northrop
Lease Financing Corp.
3 Radnor Corporate Center
100 Matsonford Road
Radnor, PA. 19087
215/527-4450

BUY SELL LEASE

370 PERIPHERALS
Disk Printers
Tape I/O

370 CPU's
135/145/155
138/148/158

GSD
Sys. 32/34/38
All Sys. 3

DATA ENTRY
37XX/5496
All 3200

UNIT RECORD
029/129
083/557

DAC Buys Rental Credit Equipment
Call or Write

DATA AUTOMATION CO, INC.

4858 Cash Road
Dallas, Texas 75247
214 637-6570

Member of Computer Dealer Association

3270's

AVAILABLE NOW FOR SALE OR LEASE

3271 Controllers
3277-1 Displays
3277-2 Displays
3274 Contr.
3276 Contr & Display
3287 Printers
3278 Display

NF COMPUTER SALES & LEASING CORP.
1211 W. 22nd Street
Oak Brook, Ill. 60521

(312) 920-8181

Member: Computer Dealers Association

FOR SALE
SCAN-DATA
2250-1 OCR
SCANNER (1)
32K, LOADED
1 - 2250-2
KEY DISC SYSTEM
w/8 KEY STATIONS
AVAILABLE IMMED.
FOR INFORMATION
CALL 213-634-1170

FOR SALE

MICRODATA REALITY SYSTEM

96K MEMORY

1-1600 BPI Tape Drive
1-300 LPM Printer
20-Prism CRT's
6-Perkin Elmer Model 310 Carousel Printers - 120 CPS
6-Port Controller

Please Call:

Ron Walker
Old National Bank
E. 627 Sprague Ave.
Spokane, WA 99202
(509) 456-6757

CB COMPUTER BROKERS, INC.

2978 SHELBY STREET
MEMPHIS, TENNESSEE 38134
AC 901 372-2622
MEMBER - CDA

- SELL
- LEASE
- BUY
- RENT

3,32,34

YES!

SYSTEM/32
& SERIES/1

AMERICAN
COMPUTER GROUP

NOW!

SYSTEM
34

SYSTEM/3
Models 12 &15

Call (617) 261-1100
P.O BOX 68, BOSTON, MA 02215

FOR SALE BY OWNER

HONEYWELL 66/20 SYSTEM

256K CPU • 6624
451 Disk Drives
1050 CPM
Card Reader
Printers
1200 and 1600 LPM
Tape Drives
800/1600 BPI - 125IPS

• All Under
Honeywell Maintenance

Reply To:
CW Box #2159
375 Cochituate Rd., Rte. 30
Framingham, MA 01701

AVAILABLE NOW

2-Year Lease
$10,954.00

3148-K
2152
4660
6111
8075
8100

Call:

"R" Associates, Inc.
Mr. Herb Riley
713/497-1557

WHEN YOU NEED
DEC . . .

TERMINALS
- VT-100
- LA36
- LA120
- LA180

PDP11/03
SYSTEMS

LSI/11
MODULES

Demand. . .Delivery
Demand. . .Discounts
Demand. . .UNITRONIX

UNITRONIX
CORPORATION
(201) 874-8500
198 Route 206
Somerville, NJ 08876
TELEX: 833184

S/34

Available Now!

Including:
- Model E35s
- 5260 retail systems
- Remote displays

DATALEASE CORPORATION
The IBM small systems financing specialists
Westport, CT • (203) 226-9582
Cumberland, RI • (401) 333-0240
Atlanta GA • (404) 455-1480

BUY SELL

DEC
&
HEWLETT-PACKARD

SYSTEMS
OPTIONS

PERIPHERALS
TERMINALS

WDS
Western Data Systems
213/375-0523
PO Box 7000-182
Redondo Beach, CA 90277

SEE SPECIAL
AD on page ID/2

ECONOCOM
901-767-9130

WANT TO BUY

3277 3742
38 S/3 34
MODEL 15/12/10
Sun Data, Inc.
Call 1-800-241-9882
(404)449-6116

For Sale
Honeywell 2040 - System
Available Now

98K, 1200 LPM Printer, Console,
277-2 disk, 400 CPM reader,
3 - 7 track tape drives.
Under Maintenance.

Call or write:
G. G. Mazzaferro
P.O. Box 1019
Jackson, Mississippi 39205
(601) 939-4040

DEC

PDP8 • PDP11
HARDWARE

Processors	Peripherals
Disks	Tapes
Memories	Terminals

Reasonably Priced
Quick Deliveries
Fully Warranteed
Call

BROOKVALE ASSOCIATES
(516) 567-7777 • (800) 645-1167

NOW
NEW or USED
SYSTEM 34
SYSTEM 3, 32, 38
ALL PERIPHERALS AND UPGRADES

WE
PAY CASH
FOR SYSTEM 34
DELIVERY POSITIONS

CASS marketing services inc.
1442 IRVINE BLVD., SUITE 128
TUSTIN, CA 92680 • (714) 731-6911

4331-J

Avail: August, 1980
Contact: Bob Miller
CENTRON — DPL
(612) 884-3366

---

the DEC specialists

BUY
LEASE
SELL

FROM STOCK

DISK DRIVES
RM02
RM03
RP04

MEMORY
MS11JP
MS11LB
MS11LD

DATALEASE
800-854-0350
In California Call
714-632-6986
Telex: 692439
2770 East Regal Park Drive
Anaheim, California 92806

FOR SALE BY OWNER

1. IBM 370-155 1 MEGABYTE WITH DAT
2. IBM 360-65 H 7080 EMULATION
3. 3210 CONSOLE PRINTER
4. 2860/3 SELECTOR CHANNEL

BID EACH ITEM SEPARATELY
OR COMBINED
FOR RFP AND INFORMATION
CONTACT:
A.T.&T. — LONG LINES
R.J. GOODE
ROOM 5C102
BEDMINSTER, NEW JERSEY
07921
(201) 234-6269

CMI
AMERICA'S
LEADING SPECIALIST
SERVING THE USED MARKET!

For Lease
3033 Attached Processor

March 1980 Ship Date

Call 1-800-521-9648
CMI CORPORATION
(313) 362-1000

FOR SALE
PRINTERS
GE TerminNet 30.

12 each printers, priced well below market value. In stock for immediate delivery. Included magnetic tape assembly. RS 232 interface, shelf and pedestal. Full warranty.

Contact
Don Thompson
Lear Seigler
303-770-3300.

11/70

1024 KB MEMORY
600 MB
125 INCH-PER-SECOND TAPE
16 ASYNCH COMM LINES

AVAILABLE IMMEDIATELY

NORDATA
(206) 282-1170

Need To
BUY
SYSTEM/3-15D

Owens Computer Group
(312) 448-4300

BURROUGHS 4700

For Sale By Owner
- — Model B-4704
- — 256K D Memory
- — 1 MODS B9372-7 Disk
- — 2 B9390 Tape Drives
- — 1 B9112 Card Reader
- — SPO
- — 3B9134 Sorters

CONTACT:
JIM BOYLE
(412) 355-3339
JOE GURCAK
(412) 355-3376

IMMEDIATE SALE
1403 & CONTROLLER

IBM 1403-N1
IBM 2821 w/UCS

Under IBM Maintenance

Contact: Hal Bingham
HIGHLIGHTS FOR CHILDREN
614-486-0631

Available April, 1980:

IBM System 3 Model 8
1 - 5471 Console
1 - 3741 Direct Attach
1 - 1403 Printer
600 LPM
1 - 5408 CPU - DPF - 64K
4 - 5444 Drives
(9.2 MB Total)

Under IBM Maintenance
Call (314) 756-4555 or
(314) 756-4556

Mr. Brown or Mr. Vair
Principals Only Please

About the IBM Price Cut. . .

Comdisco now offers substantial lease savings for your installed or on-order 303X Processor. Flexible lease terms to meet your equipment objectives.

We have financed over $500 million in IBM Computer Equipment.

Call your nearest office or,

Comdisco, Inc.
9701 W. Higgins Road
Rosemont, IL 60018
(312) 698-3000

COMDISCO®

3033 N
Purchase/ Leaseback

Lessor wanted for our on-order system. March Delivery. For RFP Contact:

R. J. Goode
AT&T Long Lines
Room 5C102
Bedminster, New Jersey 07921
(201) 234-6269

FOR SALE OR LEASE

3262 PRINTERS

EARLY DELIVERIES!

Call or write today to:

METROPLEX COMPUTER COMPANY, INC.
MCC
7135 John Carpenter Freeway
P. O. Box 47220, Dallas, Texas 75247
(214) 634-2750
TWX 910-861-4171

FOR SALE

3 NEW DG NOVA 4/5's

w/ 32 KB Memory
in Factory Cartons
Model #8392-G

30% OFF List Price

CALL
(804) 296-8421

PDP-11 DISK DRIVES

300 MEGABYTES

AVAILABLE IMMEDIATELY

NORDATA
(206) 282-1170

For Sale or Lease

4331 S/3

IMMEDIATE DELIVERY!

S/34 S/38

Sun Data, Inc.
Call 1-800-241-9882
(404) 449-6116

Sale or Lease New

TEXAS INSTRUMENTS

990-Based Computer Systems

Typical Configuration:
- 990/10 CPU with 224 K Bytes
- 2 CDS 200 MB Disk Drives
- 4 TI 911 VDT's
- 300 LPM Printer
- DX10 T/S Operating System
- Sort/Merge, System Utilities
- 1 Compiler (RPG II, COBOL, FORTRAN, BASIC or PASCAL)
- AUTOFORM Data Entry System
- Two Weeks Training at MDS

Price – $77,500 plus tax, freight and installation

TI field service available

Call us to discuss other configurations, peripherals, terminals and conversion from your present computer.

IMMEDIATE DELIVERY
for most configurations, including 990/12 CPU.

Manufacturing applications including BOMP, MRP, Production Control, etc., also available.

Call (213) 640-0404

Mini Data Systems
2041 Rosecrans Avenue
El Segundo, California
90245

GMI
AMERICA'S LEADING SPECIALIST SERVING THE USED MARKET!

34

E-35's
Sale or Lease
AVAILABLE
NOW
Lloyd Marks

Call 1-800-521-9648
GMI CORPORATION
(313) 362-1000

Cash

FOR YOUR

PDP-11

(714) 739-2727

SEE SPECIAL
AD on page ID/2

ECONOCOM
901-767-9130

FOR SALE

MEMOREX 1270 COMMUNICATIONS CONTROLLER

BLUEBONNET COMPUTER COMPANY
1214 W. 5th
Austin, TX 78703
(512) 476-9362

TO SELL OR LEASE

4341-K1, JUNE '80 SHIP

Features 1480, 1550 and 1870 with 3278 A2 Console and 4632 Keyboard. Various other peripherals also available, including 3370's (A1 and B1) and 3420 Mod VI's.

CW Box 2170
375 Cochituate Rd., Rte. 30
Framingham, Ma. 01701

SYSTEM 34
E 35

WITH 650 LPM PRINTERS
Available 2/8/80
2/29/80

Owens Computer Group
7300 West College Drive
Palos Heights, Il. 60463
(312) 448-4300

** * * FOR SALE * * **

9 DEC TERMINAL PRINTERS

4 LA 180 @ 1,750.00 each
3 LS 120/RS
@ $1,550.00 each
2 LS 120 @ $1750.00 each

AVAILABLE IMMEDIATELY

CALL:
AIS Corp. **150 N. Finley Ave.**
Basking Ridge, N.J. **201-221-0900**

• NEW PDP 11/34 COMPUTER

- With RL01 Drives
- Available Immediately
- End Users Only
- **Call (212) 279-9700**

Ask for Marshall

IBM
3
2
7
0

PRINTERS TERMINALS & CONTROLLERS

Please Call: (312) 943-3770

Forsythe/McArthur
Associates, Inc.
919 North Michigan Avenue
Chicago, Illinois 60611

SHORT TERM LEASES

138's, /148's, /158's, /145's
3330's, 3350's, 3420's
360/40's, /50's, /65's
Call Us Collect

UNITED STATES

Boston: Eastern Regional Headquarters	**(617) 272-8110**
Arlington	(703) 521-0300
New York	(212) 832-2622
Philadelphia	(215) 293-0546
Austin: Southern Regional Headquarters	**(512) 451-0121**
Atlanta	(404) 768-6535
Dallas	(214) 233-1818
Houston	(713) 447-0325
Chicago: Central Regional Headquarters	**(312) 298-3910**
Pittsburgh	(412) 922-8920
Detroit	(313) 961-1675
Minneapolis	(612) 370-1153
St. Louis	(314) 353-8285
San Francisco: Western Regional Headquarters	**(415) 283-8980**
Los Angeles	(213) 670-7994
CANADA	
Toronto	**(416) 366-1513**

GREYHOUND COMPUTER CORPORATION
800-528-6113
Greyhound Tower, Phoenix, Arizona 85077

IDS international data services, inc.

DEC SYSTEMS

PDP 11/70's, 11/34's, 11/04's, 11/03's & Peripherals

BUY & SELL

(415) 969-7222
telex 345 592

453-D Ravendale Drive
Mountain View Ca. 94043

4341-L

Available Oct & Dec 1980

Contact: Bill Rummler
CENTRON — DPL
(612)-884-3366

Univac mod. 1004, 400 lpm, w/2K mem and summary punch, also Univac mod. 1005, 600 lpm, w/4K mem and summary punch; manuals; best reasonable offer, FOB Santa Fe. **Liturgy in Santa Fe. 1752 Camino Corrales, Santa Fe, NM, 87501 505-982-9587.**

DEC—ADDS— VERSATEC

(All New Equipment)

QTY.		
10ea.	11/03 with Dual Floppy Disc	5,000.
2ea.	11/34A-YE 256 K/B Processor	16,000.
9ea.	MS11-JP Memory	900.
10ea.	DA11-BD Unibus Link	3,600.
10ea.	DR11-B DMA Interfaces	1,400.
25ea.	H-909-BA Exp. Chassis	400.
17ea.	H775-A Battery Backup	300.
5ea.	BA11-LE Exp. Box	1,100.
10ea.	DB11-A Unibus Repeater	600.
4ea.	Versatec 1200-A Printer/Plotter	6,000.
50ea.	Kit 11-D Interfaces	500.
50ea.	Kit 11-H Interfaces	400.
60ea.	ADDS Regent 100 crts	650.
20ea.	Misc. Terminals	1,000. up

SOUTHWEST AUTOMATION CORPORATION
14760 MEMOPRIAL DR.,
SUITE 104
HOUSTON, TEXAS 77079
713-496-4391

• DATA GENERAL •
• DEC •
SURPLUS SPECIALS

4300, 4291, 4299 Data Acquisition	RP04AA RH11 RH70
4234 Disk Controller	TU 10
4241 ULM 5	M 7850
8535 Map for Nova III	DLV 11E
2 High Speed Paper Tape Readers	RKD5 J RK05 F RK11D RK8E
Core for Nova 1200	MJ 11 BE
Eclipse 16 KW Core	RPD2
SLA 4074	RPRD2
Nova 2 CPU & Memory	RPD3
Nova 1200, 840 & Nova 2's	DS 310
Linc Tape	ADDS 920
Techtronic Hard Copy Printer	TU 45
Graphics CRT Compucom 400	TU56/TC11
EDS Mighly Mux 4 or 8 Line	11/03, 11/34, 11/40
Disk Packs,	11/45, 11/60 Systems
DG 6012 & Infoton CRT	EDS Point 4 20% Discount
4060 4 Line Mux	Entrex Syslems,

BUYING OR SELLING, CALL:

• **DEC** - Bryan Eustace 305-272-2338

• **DATA GENERAL** - Phil Thomas 305-272-2339

Thomas Business Systems, Inc.

DEC
Data System 310

Three used systems available immediately

All with LA-180 printers, 16kc core, dual floppy drives and VT-50's.

Applications packages included.

ADVENT, Inc.
1509 Government St.
Mobile, AL 36604
Phone (205) 478-1777

HEWLETT-PACKARD
7905 DISC DRIVES

(15 megabytes/drive)
Under H-P Maintenance
2 available at
$6,500 each

Call J. Lucey
(212) 587-9667

DEC
DATASYSTEM
354

128KB PARITY CORE
(1) VT52
W/ATTACHMENT
(2) 2.4 MEG RK05
(1) LA180
W/ATTACHMENT
(2) EXTRA DL11
W/H967 EXPANDER
CAB,
EXPANDER BOX &
POWER SUPPLY

$36,000.00

617-775-5579

We would like to purchase a Honeywell 3200 or 2040 or comparable system. Please write to

A.B.S., Inc.
35 Market Street
Lowell, MA 01852

CLASSIFIED ADVERTISING
ORDER FORM

Computerworld's
Classifieds work.

Issue Date: Ad closing is avary Friday, 10 days prior to issue data.

Sections: Plaasa be sure to specify tha section you want: Time and Services, Software for Sala, Position Announcamants and Buy/Sell/Swap. (Available upon request: Softwara Wantad, Turnkey Systams and Real Estate.)

Copy: Wa'll typasat your ad at no extra charge. Please attach CLEAN typewritten copy. Figura about 25 words to a column inch, not including headlines.

Cost: Our ratas are $73.50 par column inch. (A column is 2" wide.) Minimum size is two column inchas (2" wida by 2" deep) and costs $147.00 par insertion. Extra space is availabla in half-inch incramants and costs $36.75. Box numbers are $10.00 extra

Billing: If you'ra a first-time advertiser, (or if you have not established an account with us), WE MUST HAVE YOUR PAYMENT IN ADVANCE.

Ad siza dasirad _____ columns wide by _____ inches deep.

Issue Data(s): ______________________

Section: ______________________

Signature: ______________________

Nama: ______________________

Company: ______________ Title: ______________

Addrass: ______________________

____

Telephone ______________________

Send this form to:

CLASSIFIED ADVERTISING, COMPUTERWORLD
375 Cochituate Road, Route 30, Framingham, MA 01701

RCA
Service Company Teleprinter Equipment Sale. Available from Inventory.
Reconditioned.

	*Price
33ASR FF	$ 450
SF	550
35ASR	700
28ASR	700
TermiNet 30 KSR W/300 Baud Modem Ansb.	1,965
Single MTA-Block Search	615
Dual MTA-Block Search	915
33ASR TWX FF or SF	1,450

*FOB RCA Shipping Point plus tax

Modems, selectors and various accessories available on request.

RCA A-193

Send Order Requests to:
RCA Service Company
Attn. Lew Arnold
Bldg. 204-2
Rt. #38
Cherry Hill, N.J. 08358

FOR SALE OR LEASE

3505 B2	3525 P3
5450, 6555 8100, 8105	1421, 1533, 5273

AVAILABLE JANUARY

Paul Sheedy: (312) 991-6262

INTERSTATE COMPUTER
SALES AND LEASING, INC.

WANTED

4341-K

FOR PURCHASE
WILL PAY PREMIUM
PRINCIPALS ONLY —
NO BROKERS
CALL OR WRITE
LARRY VONNEGUT
ESPRIT DE CORP.
900 MINNESOTA STREET
SAN FRANCISCO, CA 94107
(415) 648-6900

---

470 V/7B
Purchase/ Leaseback

Lessor wanted for our on-order system. April Delivery. For RFP Contact:

R. J. Goode
AT&T Long Lines
Room 5C102
Bedminster, New Jersey 07921
(201) 234-6269

Sale or Lease

3505-B2 3525-P3
3272-2 3742
129-3 129-2 w/Int.
029-A22, B22 & C22

Computer Products Co.
529 W 3 St., Cinti, Ohio
513-721-3399

FOR SALE: Burroughs B700 Computer, with 4.6 megabites of disk space on 2 spindles. Main processor has 48K internal memory, 160 line per minute printer. Equipped with printing console. 1. Forms Burster. 2. Forms Decollator. $12,500.00 cash, must sell due to business being sold. Contact: Carolyn Fryer, AC205-263-6666 Montgomery, Alabama.

---

the DEC specialists

BUY
LEASE
SELL

AVAILABLE FROM STOCK

LA34	1150.
LA36	1650.
LA120	2250.
LA180	2250.
VT100	1795.
DT80/1	1850.

(VT-100 Compatable)

DATALEASE

800-854-0350

In California Call
714-632-6986
Telex: 692439
2770 East Regal Park Drive
Anaheim, California 92806

FOR SALE

Six 3624/012

Consumer Transaction Facility

• Direct Attached and Other Features

Call or Write:

Carter Pittman
First Union Complex
Charlotte, N.C. 28288
(704) 374-6190

PHOTO PLOTTER WANTED

Used or new photo plotter wanted. Must be in good running condition and available immediately. Please reply to:

CW Box 2173
375 Cochituate Rd., Rte. 30
Framingham, MA. 01701

11/70 MEMORY

AVAILABLE IMMEDIATELY

NORDATA
(206) 282-1170

BUY-SELL-SWAP

FOR SALE:

Texas Instruments
990/10 Computer
192 K Bytes Memory
DS10 Disk Drive
FD1000 Floppy Disk Drive
In double-bay desk
2 911 Video Display Units
810 Printer
DX10 Operating
System Software
Pascal Compiler
Sort/Merge Utilities

$37,500 plus Shipping

Brian Wanty
O & W, Inc.
3974 Jackson Road
Ann Arbor, MI 48103
(313) 682-4353

WANTED
3340/B2F
3344/B2
3350/A2 & B2

Please Call: (312) 943-3770

Forsythe/McArthur Associates, Inc.
919 North Michigan Avenue
Chicago, Illinois 60611

IBM
S/34-E35

Ship 1 Feb. 1980
Will configure to suit
Other E-35s available
for Feb. & Mar.

TIMBERLINE
TECHNOLOGY
POB 27263
Denver, CO 80227
(303) 988-0413

SALE/LEASE

360/25 IBM

(1) 2803 MOD 1
(1) 2540
(1) 1403 MOD 2

Used Daily-Mint Condition
Under IBM Maintenance

Contact: Buck Watson
(704) 735-3003

WANTED TO BUY
PDP 11/60

Call: Dick Guilbert
212-840-6868
Anstat, Inc.
1120 Avenue of the Americas
New York, New York 10036

WANTED

3420-8

WANT TO BUY
AND LEASE BACK
ON SHORT TERM
BASIS
3420-8 TAPES
NEED 12

BLUEBONNET
COMPUTER COMPANY

1214 W. 5th
Austin, TX 78703
(512) 476-9362

BUY-SELL-LEASE BROKERAGE

Let the "Nation's Largest Wholesale Dealer"
Buy, sell, lease, sub-lease, or be your agent in placement of your pre-owned IBM 360/370 System 3, or other units.

COMPUTER INTERNAT'L LTD.
BEACH COMPUTER CORP.
CWC's Leasing Division

COMPUTER WHOLESALE CORP.
(504) 581-7741
Suite 507/508, First National
Bank of Commerce Building
New Orleans, LA 70112
Member Computer Dealers Assoc.

HAMPTON BUSINESS MACHINES CO.
A Division of DP Service Inc.
5559 N. Elston Ave. Chicago, Il. 60630
Call: 312–774-2556

NOW SYSTEM 32–34

BUY – SELL – LEASE
IBM 3741 - 3742
Keypunches · Computers – Peripherals

026	$ 750	083	$ 1600	519	$ 900
029	1750	084	2100	548	1350
129	3200	088	1800	557	3100

Tom Holland Bill Broden

BUY SELL LEASE
or
TRADE
DEC Computer Systems
and Peripherals

SOUTHWEST
AUTOMATION CORP.

14760 Memorial Drive
Suite 104
Houston, Texas 77079
713-496-4391

WE BUY
158 & 168
MEMORY

transdata corporation
214/631-5647

FOR SALE
IBM SYSTEM 3 MODEL 8
MODEL A14 (16K)

1 — 5203-1 100 LPM
1 — 5444-A1 2.5 Disk
2 — 3741 Entry Terminals

CONTACT:
Dick Curran
C & S Systems
1804 Paul St.
Omaha, Nebr. 68102
402-345-6661

WANTED
PDP-1145
SYSTEM

CARL R. BOEHME
AND ASSOCIATES, INC.
SPECIALISTS IN
DIGITAL ENGINEERING
408-727-2666

IBM
USED EQUIPMENT

SYSTEM/3 MOD 8
SYSTEM/3 MOD 10
SYSTEM/3 MOD 12
SYSTEM/32 32K/13M/80CPS
SYSTEM/32 16K/13M/285LPM
SYSTEM/34 MOD C22
SYSTEM/34 MOD C24

BOB SMITH
PDA INC.
913-677-2552

4341
Purchase/Leaseback
LESSOR WANTED FOR OUR ON-ORDER SYSTEM.
APRIL DELIVERY

FOR RFP CONTACT:
R.J. GOODE
AT&T LONG LINES
ROOM 5C102
BEDMINSTER, N.J. 07921
201-234-6269

AVAILABLE

145/HO & 768 K AMS-Feb 1
4 Chnls. Clock & Buffer
4341/K w/3278/2A May 18
3211/3811/3216 Immd.

Please Call: (312) 943-3770

Forsythe/McArthur Associates, Inc.
919 North Michigan Avenue
Chicago, Illinois 60611

WANTED

Used 12 inch magnetic tape seal straps to fit 2400 foot reels. $30 per hundred.

Contact
Bob Thomas
(412) 931-7600
Ext. 140

3420-5
TAPE DRIVES
3803-1
CONTROLLER
AVAILABLE NOW
SALE OR LEASE
NF COMPUTER SALES
& LEASING CORP.
312/920-8181

PRIME
Plug Compatible

80-300 MB Storage Module Drives
32-96 MB Cartridge Module Drives
300-900 LPM Printers

Less Than 50% Of List

TIMESHARING
SERVICES, INC.
904-396-9455

---

46 Cases 500/CTN 6 Part

14 3/8 x 8 1/2 Paper	$25.00 CTN
16 S/3 Small MB Disk Packs	20.00 Per Pack
4 Ea. 96 Col. Card Storage Cabinets	50.00 Ea.
5 Ea. 96 Col. Card Organizing Trays	15.00 Ea.
3 Ea. 7600 MSI Data Terminals	2000.00 Ea.

Phone
(813) 683-7557
Ext 212

FOR SALE OR LEASE
SYSTEM
34-E35s
EARLY DELIVERIES!

METROPLEX COMPUTER COMPANY, INC.
7135 John Carpenter Freeway
P. O. Box 47220, Dallas, Texas 75247
(214) 634-2750
TWX 910-861-4171

3033-N4
APRIL 18, 1980
LEASE ONLY

Contact: Charles Simmons
Commonwealth
Computer Advisers, Inc.
707 East Main Street
Richmond, Virginia 23219

4331
I or J
3310-A2/B2
3203-5
8809/3420
3278-2

Member Computer Dealers Association
(914) 238-9631

Computer Merchants inc
75 South Greeley Avenue Chappaqua New York 10514
Member Computer Dealers Association (914) 238 9631

Inflation Fighters

Quality & Savings

Slightly used, Money Back Guarantee. Full Reels. All External Labels Removed Guaranteed for use at 800 BPI through 6250 BPI.

2400' Reel	$4.50 ea.
1200' Reel	$4.00 ea.
600' Reel	$3.25 ea.

All Tapes with Hanging Seals
We pay freight on orders over 200 tapes
All orders shipped within 48 hours
Call or Write
Computer Tape Mart
169 B New Highway
Amityville, New York 11701
[516] 842-8512

Sale or Lease New
TEXAS INSTRUMENTS
990 Based Computer Systems

Typical Configuration:
- 990/10 CPU with 224 K Bytes
- 2 CDS 200 MB Disk Drives
- 4 TI 911 VDT's
- 300 LPM Printer
- DX10 T/S Operating System
- Sort/Merge, System Utilities
- 1 Compiler (RPG II, COBOL, FORTRAN, BASIC or PASCAL)
- AUTOFORM Data Entry System
- Two Weeks Training at MDS

Price – $77,500 plus tax, freight and installation

TI field service available

Call us to discuss other configurations, peripherals, terminals, applications, and conversion from your present computer.

Call (213) 640-0404

MINI DATA SYSTEMS
2041 Rosecrans Avenue
El Segundo, California
90245

3033
N8
Available 11/80
3033
A16
Available 5/80

Diebold
Computer
Leasing, Inc.
(201) 569-3838

IPS
YOUR BEST DEAL ON PRE-OWNED IBM SYSTEMS & COMPONENTS

Lease Only
3033-N8
Available
May 16, 1980

Sell/Lease
3031-3
Used/Available
January, 1980

Sell/Lease
3158 L
5 Chn., ISC, Mad., Sys. Extension
January 15, 1980

We're Buying
3168 Memory
3158 Memory
3148 Memory
3138 Memory
Any Delivery

Sell/Lease
3145 CPU w/ISC
3135 GF w/IFA
3115 HG2
Available Now

We're Buying
3350-A2/A2F
3350-B2/B2F
3350-C2F

New Jersey	Chicago	Atlanta
201/262-9500	312/368-0627	404/581-0055

IPSCO
IPS Computer Marketing Corp.
Mack Centre Drive, Paramus, NJ 07652
201/262-9500 Telex 642197 IPS PARA
Member Computer Dealers Association

SOFTWARE

amcor
new generation software
FOR DEC/RSTS SYSTEMS

DBMS AMBASE—A complete Data Base Management solution including: Data/File Management, Inquiry Language Report Generator. Screen Formatting for enhancing system development. This PROGRAM DEVELOPMENT SYSTEM can increase the productivity of your programming staff by as much as 80%

business control
- Order Processing
- Inventory Control
- Accounts Receivable
- Sales Analysis

accounting
- Accounts Receivable
- Accounts Payable
- Payroll
- GL/Financial Management

amcor computer corp.
1900 PLANTSIDE DRIVE · LOUISVILLE, KY. 40299 · 502/491-9820

Two distinguished products for PDP-11 users

INTAC™ Interactive Data Base Management

INTAC is a new concept for data storage and retrieval that features an easy-to-use question and answer format, built-in edit rules, multi-key ISAM data access, interactive inquiry, and a unique report generator.

MAPS™ Financial Modeling

MAPS, recognized worldwide for over five years as a leader in financial modeling and reporting, is used to construct budgets, financial forecasts, consolidations and "what if" analyses.

Call us at
(415) 856-1100

ross systems incorporated

1900 Embarcadero Road • Suite 208 • Palo Alto, California 94303 software for sale | software for sale | software for sale | software for sale | time & services

DATAPOINT USERS

Turnkey Accounting packages, in DATABUS®, available for the 1500, 1800, 5500 and 6600 models, including ARC®

- General Ledger with Supporting Schedules
- Accounts Receivable with Sales Analysis (Bal. FWD. & OPN. ITM.)
- Accounts Payable with Purchase Analysis
- Payroll Processing with Personnel Statistics
- Order Entry and Billing with Inventory Control

Each package is compatible on any Datapoint system. No need to modify or re-compile if hardware is upgraded.

- OEM and Software Representative pricing available
- Multiple package discounting
- Includes source code and full documentation
- Written warranty on all software
- Local demonstrations available
- No charge enhancements on all packages

Request write-ups and example reports from:

Mini-computer Support Group, Inc.

Representing
DATAPOINT CORPORATION
The leader in dispersed data processing™
Shaker Building — Suite 201
3645 Warrensville Ctr. Rd.
Shaker Heights, Ohio 44122
or call today at:
(216) 283-2000
DATABUS® and ARC® are registered trademarks of
Datapoint Corporation
San Antonio, Texas

FINANCIAL MODELING DEC PDP-11 RSTS/E

- Budgets
- Cash Flow
- Planning
- Consolidation
- Forecasts
- Project Evaluation

FINAR SYSTEMS

(212) 222 2784 132 Nassau St., #212
New York, NY 10038
(415) 348 6810 San Francisco
(312) 698 2023 Chicago
(713) 626 9577 Houston

FINAR
The Financial Analysis and Reporting Language

C COMPILER FROM YOURDON

Source code in C and MACRO-11
so you can fit the compiler to your needs

Narrative program logic manual
so you know exactly how it works

Documented C test stream
so you can check out your modifications

C and RSX* runtime libraries
so you can load and go in RSX*

License: $2,500 Support: $500/year

SCOTT GUTHERY, (212) 730-5840
YOURDON SOFTWARE
PRODUCTS GROUP
1133 Avenue of the Americas, New York, N.Y. 10036

RSX* is a registered trademark of Digital Equipment Corp

DATAMATE COMPANY

Datamate & Genius
Database software for
NCR 8150, 8200 & 8400 computers.
Dealer inquiry invited.

Datamate Company
1419 S. Quincy
Tulsa OK 74120
918 584-4278

RSX11 RT11/TSX

DEC WP SATURN WORD PROCESSING

FEATURES:

- — Screen oriented
- — Integrated system
- — Standard ASCII Files
- — Editor & Formatter entirely in assembler for fast response
- — Faster and more powerful than stand alone systems
- — Prompted Data Entry
- — List Processing
- — OEM and Distributer inquiries invited
- — Demos available

Saturn Systems, Inc.
P.O.Box 764
Hopkins, MN 55343
Phone 612-944-3982

NEW LIFE FOR *1401* PROGRAMS

CS-TRAN converts your 1401 *object* programs to COBOL for the mainframe or mini of your choice.

CS-TRAN is the *only* translator that accepts your object programs, patches and all, yet allows you to include actual COBOL paragraph names and record definitions.

If you'd like more details about new life for your 1401 programs just call or write Russ Sandberg.

C·S Computer Systems Inc.
90 John Street, New York, NY 10038
212-349-3535

DPRO

(Disk Pack Re-Organizer)

- Analyzes DASD Usage
- Reduces file access time
- Analyzes any number of files and volumes simultaneously
- Analyzes PDS member usage
- Provides detailed analysis of usage of Data Base files
- MVT, VSI, SVS MVS
- 2305, 2314, 3330, 3350
- First year's license $1,500

For more information, contact:

ROYAL SOFTWARE ASSOCIATES
P.O. Box 3057
Gaithersburg, MD 20760
(301) 840-8556

PDP-11 USERS WORD PROCESSING NOW AVAILABLE IN PASCAL

Versions are available for use with RT-11*, RSX*, and RSTS-E* operating systems.

All are designed for easy addition to present EDP installations. Combine the power of WP on your present DP units. Complete hardware/software systems also available. For complete information, call or write:

Structural Programming Inc.
83 Boston Post Road
Sudbury, Massachusetts 01776
Telephone 617-443-5366
TWX 710-347-1054

*PDP, RT-11, RSX and RSTS-E are registered trademarks of Digital Equipment Corporation.

TEXAS INSTRUMENTS

Interactive, multi-terminal, 100% COBOL, 200+ programs, 75,000+ lines of code

- ORDER PROCESSING
- SALES ANALYSIS
- INVENTORY CONTROL
- RECEIVABLES
- PAYABLES
- PAYROLL
- BILLS OF MATERIAL

Also available for NTSC (Sycor)
O.E.M. inquiries welcome
Great Lakes Information Systems Ltd.
15 Research Dr., Ann Arbor, MI 48103
(313) 663-6402

DEC Information Retrieval System

'Mini-DMS provides rapid info query and report on DEC systems - 11/03 and up.

Custom screen design included
call
Mini Computer Associates
(201) 229-5714
P.O. Box 102
Monmouth Beach, NJ 07750

RPG/RPG II to PL/1

Dataware's software translator converts RPG and RPG II programs to an optimized PL/1 (DOS or OS) The translator achieves an extremely high percentage of automatic conversion (approaching 100%) of the source code.

- **PL/1 to COBOL**
- **EASYCODER/TRAN to COBOL**
- **BAL/ALC to COBOL**
- **AUTOCODER (7070) to COBOL**
- **COBOL to COBOL**
- **AUTOCODER/SPS to COBOL**
- **RPG to COBOL**

For more information on our translators, write or call today

Dataware, Inc.
2565 Elmwood Avenue
Buffalo, NY 14217
(716) 876-8722

ATTENTION . . .

Construction Users
OEMs
Computer Manufacturers

AVAILABLE IN ANS COBOL 74

Complete job cost construction accounting system. For those who wish to provide systems to this vast untapped user market.

- **Software**
- **Systems Design**
- **Consulting**
- **Marketing Support**

ADATA
CORPORATION
P.O.Box 55184
Indianapolis, IN 46220
(317) 257-5658

TIME

BROKERS OF COMPUTER TIME

N.Y. & Phila
Metro Areas Only
Computer Reserves, Inc.

(212) 599-0770
(201) 676-1881

ATTENTION COMPUTER USERS!

FAMILIAR PROBLEMS?

PROCESSING OVERFLOW | ANALYST NEEDS | UPGRADE YES/NO | POOR SERVICES

PROBLEMS SHOULD BE DISCUSSED . . . WE LISTEN

370/155 • 370/158 • 370/168 • 3032 • AS6
BATCH – RJE – TIMESHARING TSO – CMS
PROPRIETARY PACKAGES

CHECK OUT OUR QUALITY SERVICES
. . . AT SENSIBLE RATES

CALL: (201) 494-6750

Allied Computer Services, Inc.
3900 PARK AVENUE • EDISON NEW JERSEY 08817

MEMORY REPAIRS

ALL MANUFACTURERS
DEC, NOVA, EMM, DATARAM
PLESSEY, HARRIS, OR ANY OTHER

- 10 Day Turnaround.
- 90 Day Warranty.
- Core or Semi Stack Repairs.
- Reasonable Prices (From $90).
- Low Flat Fees Available for Oems, Large Users and Repair Labs. 100% Burn-in.

DIGITAL DATA SYSTEMS, INC
1396 N.W. 65 Terr., Plantation, FL 33313
(305) 792-3290
OUR 8TH YEAR OF SERVICE

COMPU COVER

PROTECT YOUR COMPUTER FROM FAULTY SPRINKLER AND OTHER WATER LINES HAZARDS!

360/370, SYS 3, SYS 32/34

S/3 SUPPLY COMPANY INC.
201 Mortimer Avenue
Rutherford, New Jersey 07070

IBM — 360/50 TIME

- **512 K**
- **2314-01 1x9 Disk Drives**
- **6 2401-05 Dual Density/Sims Tape Drives**
- **1 23440 Card Read Punch**
- **1 1403-N1 Printer**
- **70-80 K Partitions Available During Prime Time**
- **Large or Small Blocks of Time Available. All Shifts.**

Contact:
Jim Quinn
(312) 465-3634
Warner Electric Co.
1512 W. Jarvis
Chicago, Il. 60626

370/168 mod 3 Datacenter

6.0 meg MVS

Specializing in
Remote Job Entry
TSO, CICS, and Batch
IBM 3800 Laser Printer
Very Attractive Rates
Contact: Stu Kerlevsky
(212) 564-3030

Datamor
132 West 31 St.
New York, N.Y. 10001

I.B.M. 360-40

All Shifts, 128K, 4-2401 MOD-2, 9-2314, 1403-N1, 2540, 1401 Compatibility.

From $35/Hour

Restaurant Associates, Inc.
1540 Broadway
New York, N.Y. 10036
Contact:
Al Palmo (212) 997-1413
Charles Leigey (212) 997-1411

PERIPHERAL REPAIRS

Dataproducts - 2230 Line Printer
DEC - LA36, LA180, LP11, RX01, RK05, RK11
Printers - Terminals - Floppys

Three Delta Corp
1038 Kiel Court
Sunnyvale, Ca. 94086
(408) 734-2680

Computer Time For Rent

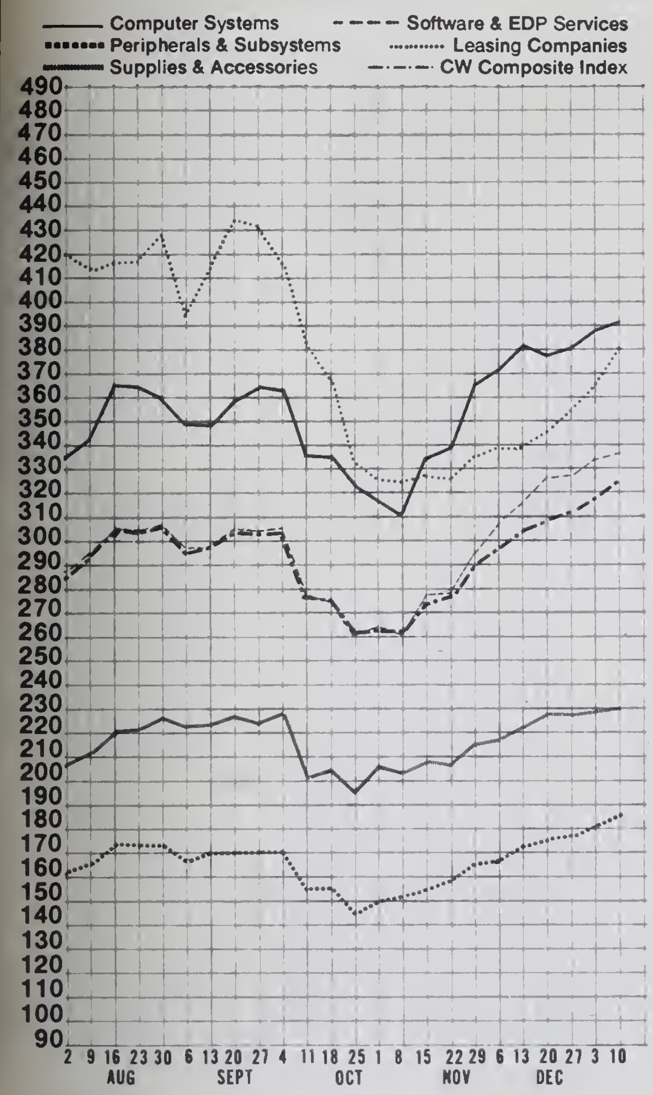
At reasonable rate with good operational support

IBM 370-145 in Manhattan

1/2 meg, 6-3330's, 7 tapes
2-1403 printers, DOS-US,

DEC-11/70 in Long Island
DEC 11/34 in N. NJ
R. Fleischer (516) 621-2826
Wanted used Kimball KR1200

Computerworld Stock Trading Index



COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

CW COMMUNICATIONS/INC.
Board Chairman/Publisher
Patrick J. McGovern
President
W. Walter Boyd

VP-Research Jack Edmonston
VP-Marketing Roy Einreinhofer
VP-Editorial E. Drake Lundell, Jr.
VP-Finance William P. Murphy
VP-Circulation Margaret Phelan
VP-Production Lee Vidmer

Computerworld Headquarters
375 Cochituate Road
Framingham, Mass. 01701
Phone: (617) 879-0700
Telex: 95-1153

SALES
Vice President Roy Einreinhofer
Administrator Frank Collins
Display Adv Melinda Walker
Miriam Gaylin
Classified Adv Mgr William J. Mills

RESEARCH
Vice President Jack Edmonston
Market Research Kathryn Dinneen

CIRCULATION
Vice-President Margaret Phelan
Circulation Mgr Barbara Jeannetti
Service Rep Peggy Kelly
Assistant Carmela Priante

PRODUCTION
Vice-President Lee Vidmer
Production Mgr Peter Holm
Supervisor Henry Fling
Typesetting Mgr Tom Pfau

Computerworld Sales Offices

Roy Einreinhofer
Vice-President/Marketing
Frank Collins
Manager, Display Advertising
William J. Mills
Manager, Classified Advertising
COMPUTERWORLD
375 Cochituate Road
Framingham, Mass. 01701
Phone: (617) 879-0700
Telex: 95-1153

BOSTON
Robert Ziegel
Northern Regional Manager
Chris Lee
Senior Account Manager
Edward P. Marecki, Jr.
Account Manager
Kathy Doyle
Account Coordinator
COMPUTERWORLD
375 Cochituate Road
Framingham, Mass. 01701
Phone: (617) 879-0700
Telex: 95-1153

NEW YORK
Donald E. Fagan
Eastern Regional Manager
Mike Eisenkraft
District Manager
Peter Senft
District Manager
COMPUTERWORLD
2125 Center Avenue
Fort Lee, N.J. 07024
Phone: (201) 461-2575

CHICAGO
Thomas H. Knorr, Jr.
Midwestern Manager
Jane Wrightman
Account Coordinator
COMPUTERWORLD
230 North Michigan Avenue
Chicago, Ill. 60601
(312)782-7565

SAN FRANCISCO
William J. Healey
Western Regional Manager
Ruth Gordon
Account Coordinator
COMPUTERWORLD
353 Sacramento Street
Suite 600
San Francisco, Calif. 94111
Phone: (415) 421-7330

LOS ANGELES
Jim Richardson
District Manager
Bob Hubbard
Account Manager
Kathie Knox
Account Coordinator
COMPUTERWORLD
3420 Ocean Park Boulevard
Suite 3020
Santa Monica, Calif. 90405
Phone: (213) 450-7181

JAPAN
Mr. Shigema Takahashi
General Manager
DEMPA/COMPUTERWORLD
1-11-15 Higashi Gotanda
Shinagawa-ku, Tokyo 141
Phone: (03) 445-6101
Telex: J2424461

UNITED KINGDOM
Steve Burton
IDG PUBLISHING LTD.
140-146 Camden Street
London NW1 9PF
Phone: (01) 267-1201
Telex: UK-264737

WEST GERMANY
CW PUBLIKATIONEN
Friedrichstrasse 31
8000 Munich 40
Phone: (089) 34-90-61
Telex: W.Ger-5-215250-HKFD

AUSTRALIA
Alan Power
COMPUTERWORLD PTY. LTD.
3 Bruce Street
Crows Nest, NSW 2065
Phone: 929-5388
Telex: SECCO AA25468

BRAZIL
Eric Hippeau
COMPUTERWORLD do BRAZIL
Servicos e Publicacoes Ltda.
Rua Alcindo Guanabara
25/10th floor
20031 Rio de Janeiro, RJ
Phone: (021) 242-7395
Telex: 11-32017 (WORD BR)

TRADE QUOTES

Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, JANUARY 9, 1980

All statistics compiled, computed and formatted by
TRADE QUOTES, INC.
Cambridge, Mass. 02139

COMPUTER SYSTEMS

FXCH		PRICE 1979-80 RANGE (1)	CLOSE JAN 9 1980	WEEK NET CHNGE	WEEK PCT CMNGE
A	AMDAHL CORP	17- 69	24 3/8	-1 3/8	-5.3
N	BURROUGHS CORP	59- 87	81 3/8	+3	+3.8
O	COMPUTER AUTOMATION	9- 44	13 1/4	+ 1/2	+3.9
N	CONTROL DATA CORP	23- 57	55 3/4	+1 1/2	+2.7
D	CRAY RESEARCH INC	8- 51	48 1/2	+ 1/2	+1.0
N	DATA GENERAL CORP	42- 74	59 1/4	+4 3/8	+7.9
N	DATAPOINT CORP	34-105	102 3/4	-1 1/4	-1.2
N	DIGITAL EQUIPMENT	39- 69	68 1/2	- 3/8	-0.5
N	ELECTRONIC ASSOC.	2- 13	7 3/4	+ 3/4	+10.7
A	ELECTRONIC ENGINEER.	9- 19	17 5/8	+1 3/8	+8.4
N	FOUR-PHASE SYSTEMS	19- 47	33 5/8	-13 1/8	-28.0
N	FOXBORO	28- 44	37 3/4	+ 1/8	+0.3
O	GENERAL AUTOMATION	7- 26	17	+1 3/4	+11.4
O	GRI COMPUTER CORP	1- 3	1/2	0	0.0
N	HEWLETT-PACKARD CO	24- 63	59 1/4	+ 1/8	+0.2
N	HONEYWELL INC	43- 85	83 5/8	+ 3/8	+0.4
N	IBM	62-321	65 3/8	+1	+1.5
D	MANAGEMENT ASSIST	9- 29	18 3/4	+ 1/8	+0.6
O	MANUFACTURING DATA S	9- 38	35 1/2	-1 3/4	-4.6
O	MINI-COMPUTER SYST	2- 8	3 1/8	+ 1/4	+8.6
O	MODULAR COMPUTER SYS	7- 18	12 1/2	- 1/4	-1.9
N	NCR	37- 81	72 7/8	+3 5/8	+5.2
N	PRIME COMPUTER INC	9- 25	24	- 7/8	-3.5
N	PERKIN-ELMER	17- 43	42 3/4	+ 3/4	+1.7
N	SPERRY RAND	33- 52	51 1/2	+1	+1.9
A	SYSTEMS ENG. LABS	11- 24	18 7/8	- 3/8	-1.9
O	TANDEM COMPUTERS INC	13- 43	41 3/4	- 3/4	-1.7
A	WANG LABS.	6- 34	33 5/8	+1 5/8	+5.0

LEASING COMPANIES

FXCH		PRICE 1979-80 RANGE (1)	CLOSE JAN 9 1980	WEEK NET CHNGE	WEEK PCT CMNGE
O	BOOTHE FINANCIAL CP	13- 21	17	0	0.0
D	COMDISCO INC	3- 21	13 1/4	0	0.0
A	COMMERCE GROUP CORP	1- 1	3/8	0	0.0
A	COMPUTER INVSTRS GRP	1- 7	2 1/2	+ 3/8	+17.6
O	CONTINENTAL INFO SYS	3- 15	3 1/2	0	0.0
M	DATRONIC RENTAL	1- 4	2 5/8	+ 1/4	+10.5
A	DCL INC	3- 6	5 1/4	0	0.0
N	DPF INC	8- 14	8	- 3/8	-4.4
N	ITEL	4- 36	5 1/8	- 1/4	-4.6
N	LEASCO CORP	24- 60	58 3/4	-1 1/4	-2.0
O	LEASPAC CORP	1- 4	1/8	0	0.0
A	PIONEER TEX CORP	2- 7	3 7/8	+1 1/4	+47.6
N	U.S. LEASING	12- 20	14 1/4	- 5/8	-4.2

FXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

SOFTWARE & EDP SERVICES

EXCM		PRICE 1979-80 RANGE (1)	CLOSE JAN 9 1980	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	1- 2	1	- 1/8	-11.1
D	ANACOMP INC	8- 24	17 1/4	0	0.0
D	ANALYSTS INTL CORP	3- 5	5 1/4	+ 1/2	+10.5
A	APPLIED DATA RES.	8- 17	8 7/8	- 5/8	-6.5
N	AUTOMATIC DATA PROC	24- 40	36	+1	+2.8
O	COMPU-SERV NETWORK	5- 18	18	0	0.0
O	COMPUTER HORIZONS	1- 9	4 1/2	- 1/2	-10.0
O	COMPUTER NETWORK	5- 16	6 1/2	+ 1/8	+1.9
N	COMPUTER SCIENCES	8- 20	19 1/4	+ 5/8	+3.3
O	COMPUTER TASK GROUP	1- 7	6 3/4	0	0.0
O	COMPUTER USAGE	2- 4	2 3/4	+ 3/8	+15.7
O	COMPUT AUTO REP SVC	4- 10	5 3/4	0	0.0
O	COMSHARE	6- 26	18	-1	-5.2
O	CULLINANE CORP	14- 33	28 1/2	-1	-3.3
O	DATA DIMENSIONS INC	1- 9	1 7/8	- 1/4	-11.7
O	DATATAB	1- 4	1 1/4	+ 1/8	+11.1
O	DSI CORP	4- 8	6 3/4	+ 1/2	+8.0
N	ELECTRONIC DATA SYS.	15- 28	26 1/2	- 1/4	-0.9
O	INSYTE CORP	1- 3	1 3/8	- 1/8	-8.3
O	IPS COMPUTER MARKET.	2- 3	3	0	0.0
O	KEANE ASSOCIATES	3- 6	6 1/4	+ 1/4	+4.1
D	KEYDATA CORP	1- 4	3 3/4	- 3/8	-9.0
A	LOGICON	10- 21	19 3/4	+ 1/8	+0.6
O	NATIONAL DATA CORP	7- 17	16 1/8	- 1/8	-0.7
N	PLANNING RESEARCH	4- 10	6 3/4	+ 7/8	+14.8
O	PROGRAMMED TAX SYSTS	3- 5	4 1/8	- 1/8	-2.9
O	PROGRAMMING & SYS	1- 1	7/8	0	0.0
O	RAPIDATA INC	3- 7	5	+ 1/8	+2.5
O	REYNOLDS & REYNOLD	18- 36	27	-1 1/4	-4.4
O	SCIENTIFIC COMPUTERS	3- 11	11	+1 3/4	+18.9
N	TYMSHARE INC	18- 54	53	+1 3/8	+2.6
A	UPS SYSTEMS	5- 10	8 7/8	- 1/8	-1.3
N	WYLY CORP	1- 7	6 1/8	+ 1/8	+2.0

PERIPHERALS & SUBSYSTEMS

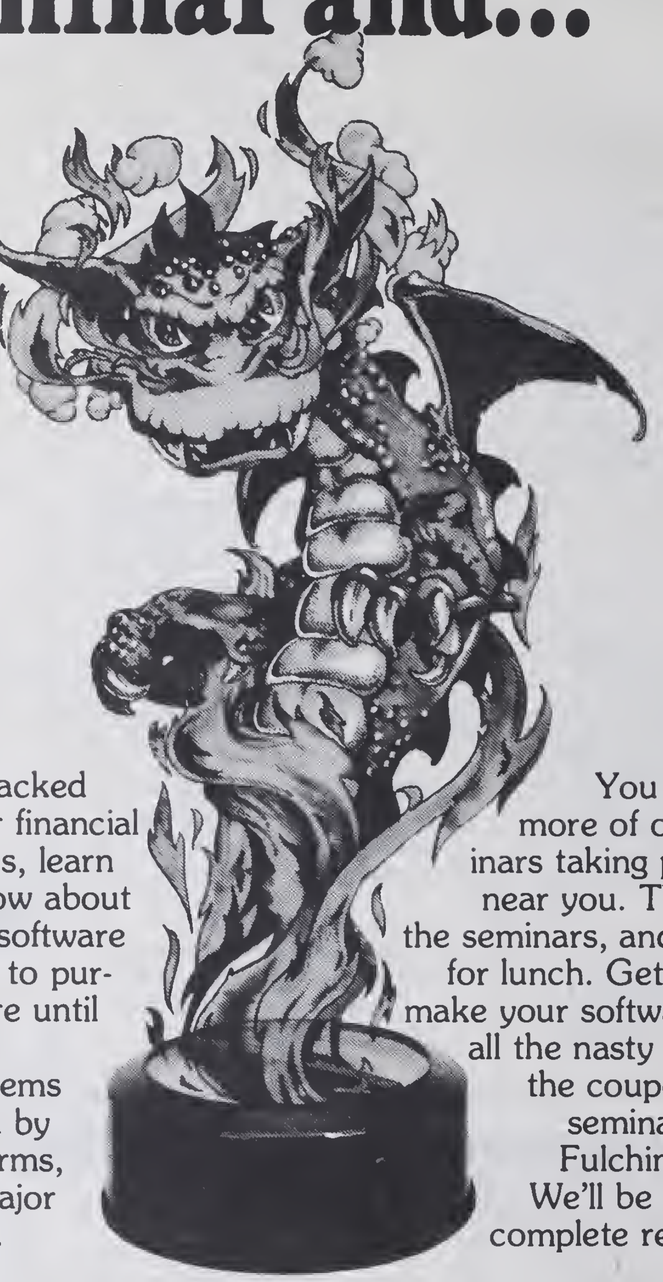
EXCM		PRICE 1979-80 RANGE (1)	CLOSE JAN 9 1980	WEEK NET CHNGE	WEEK PCT CHNGE
N	AM INTERNATIONAL	13- 32	17 7/8	+1 1/8	+6.7
N	AMPEX CORP	10- 21	20 5/8	- 1/8	-0.6
O	ANDERSON JACOBSON	5- 16	14 1/8	- 7/8	-5.8
N	APPLIED DIG DATA SYS	6- 22	9 1/8	+ 5/8	+7.3
O	AUTO-TROL TECHNOLOGY	14- 36	32 1/2	-1 1/2	-4.4
O	BEEHIVE INT'L	3- 7	5 7/8	+1 1/8	+23.6
A	BOLT,BERANEK & NEW	6- 19	17	- 1/4	-1.4
N	BUNKER-RAMO	10- 31	30 3/8	+1 1/2	+5.1
O	CAMBRIDGE MEMORIES	1- 9	2	- 1/4	-11.1
O	COMPUTER DEVICES INC	5- 8	7 7/8	- 3/8	-4.5
N	CENTRONICS DATA COMP	16- 54	46 1/4	-3 5/8	-7.2
O	COGNITRONICS	1- 4	3	+ 1/2	+20.0
O	COMPUTER COMMUN.	6- 10	6 1/4	+ 3/4	+13.6
O	COMPUTER CONSOLES	4- 20	18	- 1/2	-2.7
A	COMPUTER EQUIPMENT	3- 6	6 3/8	0	0.0
O	COMPUTER TRANSCEIVER	1- 5	3 3/8	- 1/8	-3.5
O	COMPUTERVISION CORP	5- 56	54 1/8	+3 3/4	+7.4
N	CONRAC CORP	13- 26	18 3/4	+2 1/8	+12.7

EXCH		PRICE 1979-80 RANGE (1)	CLOSE JAN 9 1980	WEEK NET CHNGE	WEEK PCT CHNGE
A	DATA ACCESS SYSTEMS	0- 11	10 1/4	0	0.0
A	DATA PRODUCTS CORP	13- 25	20	- 7/8	-4.1
O	DATUM INC	2- 6	2 1/4	- 1/8	-5.2
O	DECISION DATA COMPUT	2- 6	2 5/8	0	0.0
O	DELTA DATA SYSTEMS	1- 1	7/8	0	0.0
N	DOCUMATION INC	6- 34	16	- 5/8	-3.7
O	DATARAM CORP	6- 35	33	+ 3/4	+2.3
N	ELECTRONIC M & M	3- 9	4	- 1/8	-3.0
O	EVANS & SUTHERLAND	20- 42	38	- 1/2	-1.2
O	FABRI-TEK	1- 2	7/8	- 1/8	-12.5
O	GENERAL COMPUTER SYS	1- 3	2 1/8	+ 1/8	+6.2
O	GENERAL DATACOMM IND	9- 24	23	- 1/4	-1.0
N	HAZELTINE CORP	10- 26	25	+4 5/8	+22.6
N	HARRIS CORP	17- 37	36 5/8	+3 3/4	+11.4
O	INFOREX INC	1- 11	1 3/4	+ 1/8	+7.6
O	INFORMATION INTL INC	7- 12	10	+1	+11.1
O	INFOTON	1- 3	2 5/8	+ 1/4	+10.5
O	INTEL CORP	26- 72	69 3/4	+2 1/4	+3.3
O	INTERSIL	7- 32	26	+1	+4.0
A	LUNDY ELECTRONICS	4- 8	8 1/4	+1 5/8	+24.5
O	MSI DATA CORP	6- 19	8 3/4	- 1/4	-2.7
N	MEMOREX	17- 59	17 3/8	- 1/2	-2.7
N	MOHAWK DATA SCI	6- 17	16 5/8	- 1/2	-2.9
O	OMEX	2- 8	8 1/2	0	0.0
O					
O	SCAN DATA	1- 5	2 3/8	+ 1/4	+15.1
N	STORAGE TECHNOLOGY	14- 46	17	- 3/8	-2.1
O	SYKES DATATRONICS	4- 20	22 3/4	+2 1/2	+12.3
O	T BAR INC	11- 26	24	-1	-4.0
A	TEC INC	6- 13	6 3/8	+ 1/4	+4.0
N	TEKTRONIX INC	33- 63	57 3/4	-2 1/8	-3.5
O	SCAN DATA	1- 5	2 3/8	+ 1/4	+15.1
N	STORAGE TECHNOLOGY	14- 46	17	- 3/8	-2.1
O	SYKES DATATRONICS	4- 20	22 3/4	+2 1/2	+12.3
O	T BAR INC	11- 26	24	-1	-4.0
A	TEC INC	6- 13	6 3/8	+ 1/4	+4.0
N	TEKTRONIX INC	33- 63	57 3/4	-2 1/8	-3.5
N	TELEX	3- 9	4 1/8	+ 1/8	+3.1
O	TESDATA SYSTEMS CP	8- 26	10 3/4	- 3/4	-6.5
O	TIMEPLEX INC	4- 11	10 3/8	- 1/4	-2.3
O	WILTEK INC	1- 2	1/4	0	0.0

SUPPLIES & ACCESSORIES

EXCH		PRICE 1979-80 RANGE (1)	CLOSE JAN 9 1980	WEEK NET CHNGE	WEEK PCT CHNGE
A	AMERICAN BUS PRODS	6- 12	11 1/4	0	0.0
O	BALTIMORE BUS FORMS	1- 4	1	0	0.0
N	BARRY WRIGHT	14- 34	26 1/4	+1 3/8	+5.5
O	CYBERMATICS INC	1- 1	1	+	+6.6
O	DUPLEX PRODUCTS INC	13- 31	26	+ 1/8	+0.4
N	ENNIS BUS. FORMS	5- 21	17	- 1/4	-1.4
N	3M COMPANY	43- 66	49 3/8	- 7/8	-1.7
O	MOORE CORP LTD	26- 34	30	+ 1/2	+1.6
N	NASHUA CORP	18- 37	28 3/4	+ 3/8	+1.3
O	STANDARD REGISTER	20- 29	26 1/2	0	0.0
A	TAB PRODUCTS CO	8- 19	17 1/8	-1 1/4	-6.8
A	WABASH MAGNETICS	10- 22	14 5/8	+ 3/8	+2.6
N	WALLACE BUS FORMS	18- 33	28 3/8	- 3/8	-1.3

Attend a free McCormack & Dodge seminar and...



In a series of information-packed seminars conducted by our financial and data processing experts, learn everything you need to know about state-of-the-art accounting software packages. You can't afford to purchase new financial software until you've checked out ours. McCormack & Dodge systems have already been checked by the 'big eight' accounting firms, the IRS and by over 850 major companies now usng them.

You can enroll in one or more of our six product seminars taking place in a major city near you. There's no charge for the seminars, and you'll be our guest for lunch. Get the facts needed to make your software decisions. Avoid all the nasty surprises. Just send the coupon below or call our seminar coordinator, Gina Fulchino at (617) 449-4012. We'll be pleased to send you complete registration materials.

Learn about the financial software that's not full of nasty surprises.

CW1/14/80

Seminar Schedule

UNITED STATES

February 12 NEW YORK
February 13 CHICAGO
February 21 BOSTON
February 26 LOUISVILLE
February 27 MINNEAPOLIS
February 28 ST. LOUIS
March 4 BUFFALO
March 5 INDIANAPOLIS
March 12 LOS ANGELES
March 13 KANSAS CITY
March 18 SAN FRANCISCO
March 20 DETROIT
March 25 PHILADELPHIA
March 31 DENVER
April 8 HOUSTON
April 9 JACKSONVILLE
April 10 NEWARK
April 15 ATLANTA
April 17 COLUMBUS
April 22 STAMFORD
April 29 DALLAS
April 30 NASHVILLE
May 1 CHICAGO
May 8 WASHINGTON, D.C.
May 8 SEATTLE
May 13 PITTSBURGH
May 15 LOS ANGELES

CANADA

February 28 TORONTO
March 27 MONTREAL
April 17 OTTAWA
April 24 CALGARY
May 13 VANCOUVER

Seminars Available:

- **General Ledger/Financial Anlysis System**
- **General Ledger Workshop**
- **Accounts Payable System**
- **Fixed Asset Analysis & Accounting System**
- **Capital Project Analysis & Accounting System**
- **Purchasing Information Management System**

☐ Please send me an official registration form and agenda.
☐ I can't attend the seminar but would like more information on ______________________
____.

Name ______________________ Title ______________
Company ______________________ Tel. ______________
Address ______________________________________
City ______________ State ______________ Zip ______________
Computer Hardware ______________________________

McCORMACK & DODGE CORPORATION
560 Hillside Avenue, Needham Heights, MA 02194, (617) 449-4012

Atlanta, Chicago, Dallas, Los Angeles, Phoenix, Toronto, Washington, D.C.
United Kingdom/Netherlands • RTZ Computer Services, London — Australia/New Zealand • Adaps Software Ltd., Melbourne, Sydney
Italy • General Systems S.p.A., Milano, Torino